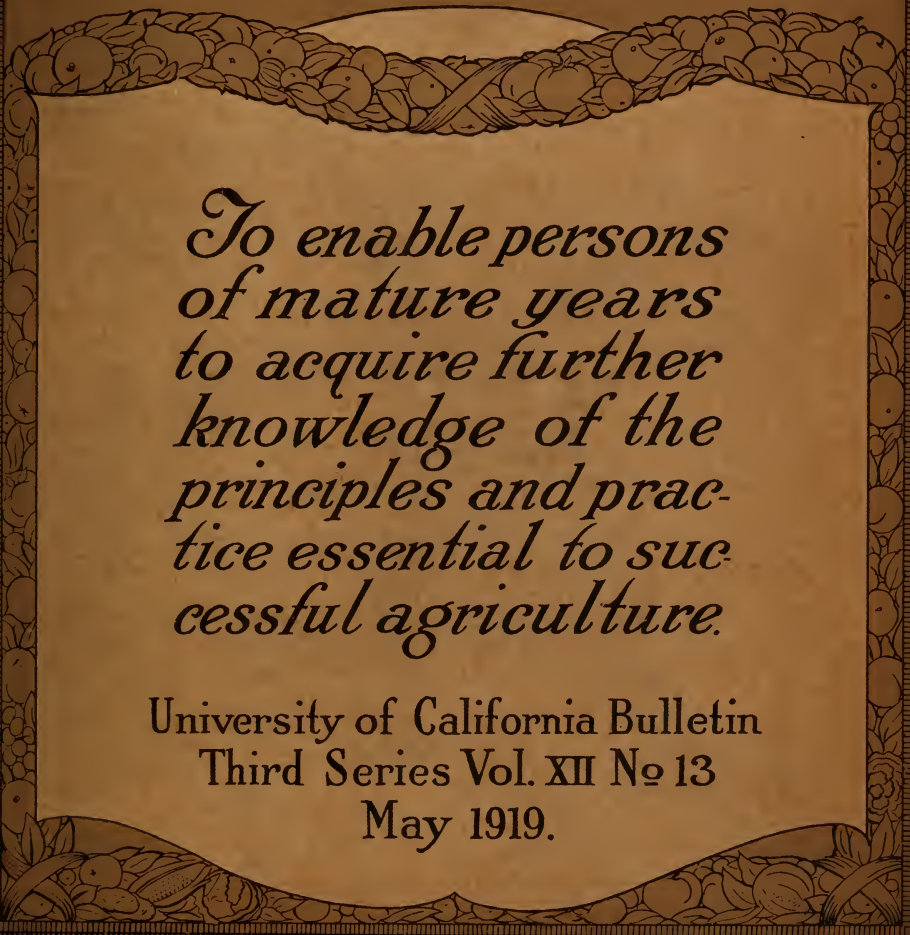


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Farmers' Short Courses

September to December 1919

University Farm Davis



*To enable persons
of mature years
to acquire further
knowledge of the
principles and prac-
tice essential to suc-
cessful agriculture.*

University of California Bulletin

Third Series Vol. XII No 13

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ORGANIZATION OF THE UNIVERSITY

The University of California is an integral part of the public educational system of the State. As such it completes the work begun in the public schools. Through aid from the State and the United States, and by private gifts, it furnishes instruction in literature and in science, and in the professions of engineering, art, law, medicine, dentistry, and pharmacy. In the Colleges of Letters and Science, Commerce, Agriculture, and Engineering these privileges are offered without charge for tuition, to all residents of California who are qualified for admission. Non-residents of California are charged a tuition fee of ten dollars each half-year. In the professional colleges, except that of Law, tuition fees are charged. The instruction in all the colleges is open to all qualified persons, without distinction of sex. The Constitution of the State provides for the perpetuation of the University, with all its departments.

Letters of inquiry concerning the College of Agriculture should be addressed to the *Dean of the College of Agriculture, Berkeley, California.*

For the following circulars of information concerning the several colleges and departments of the University apply to the *Recorder of the Faculties, University of California, Berkeley, California.*

1. The Circular of Information, Academic Departments (College of Letters and Science and Engineering, and the first two years of Medicine). Containing general information about the University, its organization, government, faculties, requirements for admission both to graduate and undergraduate status, requirements for degrees and teachers' recommendations, expenses.
2. The Annual Announcement of Courses of Instruction in the Academic Colleges. Published annually in July. Price 10 cents. Sent by mail by the Recorder of the Faculties for 15 cents.
3. The Announcement of the Summer Session in the Academic Colleges, published annually in March. Sent free.

UNIVERSITY OF CALIFORNIA AGRICULTURAL EXPERIMENT STATION
COLLEGE OF AGRICULTURE
BERKELEY

BENJ. IDE WHEELER, PRESIDENT
THOMAS FORSYTH HUNT, DEAN AND DIRECTOR
H. E. VAN NORMAN, VICE-DIRECTOR AND DEAN
UNIVERSITY FARM SCHOOL

ANNOUNCEMENT
OF
FARMERS' SHORT COURSES

September to December, 1919

UNIVERSITY OF CALIFORNIA PRESS
BERKELEY
May, 1919

INSTRUCTIONAL STAFF

- R. L. ADAMS, Professor of Farm Management.
H. S. BAIRD, Assistant Professor of Dairy Industry.
J. R. BEACH, Instructor in Veterinary Science.
S. H. BECKETT, Associate Professor of Irrigation Practice.
H. L. BELTON, Instructor in Shopwork.
Miss A. E. BROWN, Librarian.
V. C. BRYANT, Assistant Professor of Agricultural Extension.
C. V. CASTLE, Assistant in Animal Husbandry.
W. T. CLARKE, Professor of Agricultural Extension and Superintendent of Farmers' Institutes.
G. A. COLEMAN, Instructor in Entomology.
S. L. DENNING, Instructor in Dairy Industry.
E. R. DE ONG, Instructor in Entomology.
H. DONS, Creamery Foreman.
J. E. DOUGHERTY, Associate Professor of Poultry Husbandry.
L. J. FLETCHER, Assistant Professor of Agricultural Engineering.
F. FLOSSFEDER, Assistant Professor of Viticulture.
J. W. GILMORE, Professor of Agronomy.
J. W. GREGG, Professor of Landscape Gardening and Floriculture.
E. J. HAUSER, Assistant in Poultry Husbandry.
F. M. HAYES, Assistant Professor of Veterinary Science.
A. H. HENDRICKSON, Assistant Professor of Pomology.
G. W. HENDRY, Assistant Professor of Agronomy.
W. B. HERMS, Associate Professor of Parasitology.
W. L. HOWARD, Professor of Pomology.
THOMAS FORSYTH HUNT, Dean of the College of Agriculture.
T. FRANCIS HUNT, Assistant Professor of Agricultural Extension.
R. C. INGRIM, Instructor in Shopwork.
P. B. KENNEDY, Associate Professor of Agronomy.
O. J. KERN, Assistant Professor of Agricultural Education.
C. B. LIPMAN, Professor of Soil Chemistry and Bacteriology.
W. E. LLOYD, Assistant Professor of Poultry Husbandry.
J. W. LOGAN, Hog Cholera Field Agent of the U. S. Bureau of Animal Industry.
R. B. LUNDY, Assistant in Tractor Operation.
W. W. MACKIE, Assistant Professor of Agronomy.
B. A. MADSON, Assistant Professor of Agronomy.
J. C. MARQUARDT, Assistant in Dairy Industry.
ELWOOD MEAD, Professor of Rural Institutions.
W. METCALF, Assistant Professor of Forestry.
E. L. OVERHOLSER, Assistant Professor of Pomology.

INSTRUCTIONAL STAFF—(*Continued*)

- G. L. PHILP, Instructor in Pomology.
C. L. ROADHOUSE, Professor of Dairy Industry.
S. S. ROGERS, Associate Professor of Olericulture.
C. H. SHATTUCK, Professor of Forestry.
C. F. SHAW, Professor of Soil Technology.
ALFRED SMITH, Assistant Professor of Soil Technology.
RALPH E. SMITH, Professor of Plant Pathology.
W. L. SWEET, Instructor in Pomology.
T. F. TAVERNETTI, Assistant to Dean of University Farm School.
J. I. THOMPSON, Assistant Professor of Animal Husbandry.
C. M. TITUS, Instructor in Mathematics.
G. H. TRUE, Professor of Animal Husbandry.
W. P. TUFTS, Assistant Professor of Pomology.
H. E. VAN NORMAN, Dean of University Farm School.
F. J. VEIHMEYER, Assistant Professor of Irrigation Investigations.
H. J. WEBBER, Dean of Graduate School of Tropical Agriculture, Riverside, Calif.
E. C. VOORHIES, Assistant Professor of Animal Husbandry.
W. W. WEIR, Assistant Professor of Soil Technology.
J. C. WHITTEN, Professor of Pomology.
F. W. WOLL, Professor of Animal Nutrition.
M. N. WOOD, Assistant in Pomology.

THE FARMERS' SHORT COURSES

September to December, 1919

The purpose of the Farmers' Short Courses is to enable persons, especially those of mature years and ranch experience, to acquire a knowledge of the fundamental principles of agriculture and of the results of the latest investigations in the production of fruit, field and forage crops, and livestock of the various classes. These courses also furnish an excellent opportunity for people without ranch experience, who expect to engage in some line of agriculture, to obtain both theoretical and practical instruction that will prove of the greatest value to them in their farming operations.

The *University Farm*, where the Short Courses are held, was purchased in accordance with a California statute of 1905, and comprises 779 acres of fine alluvial soil. It is situated at Davis, Yolo County, a station on the main line of the Southern Pacific Railroad, thirteen miles west of Sacramento and seventy-six miles from San Francisco. In 1917 a ranch of 300 acres, adjoining the University Farm, was rented by the University for a period of years, thus largely increasing the facilities for experimental work in dry farming, horticulture and animal husbandry. A large variety of products are grown on the University Farm, both by irrigation and by dry farming. The facilities for investigations on the duty of water are probably unequaled anywhere, and a most complete collection of devices for measuring water is installed so that their actual operation may be seen and understood.

BUILDINGS AND EQUIPMENT

The farm is provided with numerous buildings for instruction in the various phases of agriculture and horticulture. These include a large auditorium building, a commercial creamery, stock pavilion, animal husbandry, horticulture, and veterinary science buildings, mechanical shops, three dormitories, a large dining hall, and buildings for horses, dairy and beef cattle, sheep, swine, and poultry. One concrete silo and seven wooden silos furnish succulent feed throughout the year for the live-stock.



The Farm is provided with a large auditorium, a commercial creamery, stock pavilion, animal husbandry, horticulture, veterinary science buildings, three dormitories, mechanical shops, a dining hall and buildings for horses, dairy and beef cattle, sheep, swine and poultry.

Cattle.—There are 150 head of dairy cattle, the following breeds being represented: Holstein-Friesian, Jersey, Guernsey, and Ayrshire, and about fifty head of beef cattle, belonging to the Hereford, Shorthorn, and Aberdeen Angus breeds.

Sheep.—The following breeds of sheep are kept: Shropshire, Hampshire, Southdown, Cotswold, Rambouillet, and Romney Marsh. In the aggregate there are about 175 head of sheep in the breeding flock, besides a flock of 100 grade ewes kept for experimental purposes. Representatives of Toggenburg, Saanen and Anglo-Nubian milch goats and of Angoras are also kept.

Hogs.—Hog raising is highly developed. The total number of hogs handled each year is about 400, representing the Poland-China, Berkshire, Duroc-Jersey, Tamworth, Chester White, Hampshire, and Large Yorkshire breeds. The breeding herd consists of about fifty brood sows.

Horses.—There are representatives of both light and heavy horses in the horse barn, viz., twelve light harness and saddle horses and fifteen pure-bred Percherons and grade or pure-bred Shires.

Orchards.—There are thirty-five acres of vineyards and about 550 varieties of grapes; about 100 acres of almond, peach, prune, apricot, apple, pear, cherry, walnut, and olive orchards. Budding, grafting, pruning, and spraying are all taught by actual practice. Ninety acres are devoted to experiments with field and forage crops.

Creamery.—Thorough instruction in butter, cheese, and ice-cream making is offered in connection with the commercial creamery course. The University Farm Creamery is operated throughout the year in order to give creamery practice work in the Dairy Manufacture Courses. The sale of dairy products amounts to about \$50,000 a year. Cream and milk from the surrounding country or produced on the University Farm are purchased for manufacturing butter, cheese, and ice cream. A market milk route is also maintained.

Library.—The University Farm library contains about four thousand bound volumes. Sets of the publications of the Agricultural Experiment Stations and of the United States Department of Agriculture are kept on file, as well as about two hundred American and foreign periodicals, including the main agricultural papers and scientific journals of the day.

The reading room and library are open from 8 a.m. to 12 m. and from 2:15 to 5:15 p.m. daily; also four evenings a week from 7 to 9, except on Sunday, when it is open from 2 to 5 p.m.

NUMBER OF COURSES OFFERED

A ten-day Short Course in Gas Tractors is offered from September 16 to 25, 1919. Immediately following, three Short Courses, each lasting six weeks, from September 29 to November 7, will be offered in :

General Agriculture (Crop Production and Animal Husbandry),
Poultry Husbandry,
Dairy Manufactures.

These courses will be followed by the following two-week courses :

Buttermaking, November 10-22.

Cheesemaking, December 1-13.

Beekeeping for Beginners, November 10-15.

Beekeeping for Commercial Honey Producers, November 17-22.

Deciduous Fruits, December 8-20.

The two-week courses are intended primarily for farmers or dairymen who have had at least six months' practical experience in the various branches of agriculture or dairying, and only those who have had such experience will be admitted to these courses. The number of students in the Creamerymen's Course will be limited to twenty; in the course in Cheesemaking the number will be limited to sixteen; and in the course in Poultry Husbandry to forty.

ADMISSION

There are no entrance examinations to the Farmers' Short Courses and no restriction as to sex, but applicants must be at least 18 years of age. Previous practical experience is required for students in the two-week courses, as stated above.

EXPENSES

Fees and Deposits.—In the six-week courses a registration fee of \$2 is charged each student. A deposit of \$3 for breakage is also charged, but the portion not needed to pay for breakage will be returned. The full fee and deposit for each course are to be paid whether the participant is present during the whole



The care and treatment of sick animals; treatment of common diseases and ailments; minor operations. Special attention is given to hog cholera and tuberculosis; practice work bearing directly on the course is given.

or only a part of the course. In the two-week courses a registration fee of \$1 is charged, and also a deposit of \$3 for breakage in the courses of Buttermaking and Cheesemaking. No additional registration fee will be required for students who have taken one of the six-week courses the same fall.

Rooms.—Most of the rooms in the school dormitories are rented to students who occupy them eight months of the year, but Short-Course students will be accommodated so far as rooms are available. Many rooms are for rent in private homes in

the city of Davis, within five to fifteen minutes' walk from the University Farm. A member of the staff of the school will assist students in securing accommodations.

Board.—Board may be secured in the University Farm Cafeteria at an expenditure that need not exceed \$7.50 per week.

Books and Special Clothing.—Dairy students are required to wear white suits while at work in the creamery. These may be brought from home or purchased in Davis at about \$3 per suit. Other students will find it desirable to have overalls for working in the stock barns or around machinery. Books and other necessary supplies may be purchased in the Associated Students' Store at the University Farm.

The total expense incident to attending the Farmers' Short Courses will not ordinarily exceed \$75, exclusive of railroad fare, for the six-week courses, and \$25 for the two-week courses.

A brief description of the Farmers' Short Courses offered during the fall of 1919, with the daily schedule of lectures, demonstrations, practice periods, etc., will be found in the following pages.

A. SIX-WEEKS COURSES

I. THE SHORT COURSE IN GENERAL AGRICULTURE

SEPTEMBER 29 TO NOVEMBER 7, 1919

The Short Course in Agriculture is planned to meet the needs of farmers more especially interested in general agriculture or stock raising. Any man who is a grain farmer, a stock raiser, or a dairy farmer, or who intends to engage in any of these activities, should be greatly benefited by taking this course. If it enables him to save just one horse, or increase his dairy production five per cent, or the yield of barley only a sack per acre, he will be amply repaid for the time and expense incident to attending the course. This course is separated into two divisions of three weeks each, Crop Production and Animal Husbandry. The schedule has been arranged in such a manner that students who cannot attend the full six-week course may take such portions thereof as are of special value and interest to them. Some of the special subjects taught are outlined below.

Soils and Fertilizers.—Instruction in these subjects is given by means of lectures, laboratory work and field demonstrations. The knowledge thus gained will enable farmers to understand the different types of California soils and to crop them so as to maintain permanent fertility of the land.

Farm Management.—A discussion of California practices illustrated with a sample farm carried through the process of choosing, getting capital, general plan of work, layout of fields, equipment, character of crops, probable yields, selling product, accounting, cost data, leasing and selling, law questions, hiring men, and kindred subjects.

Field and Forage Crops.—The work in field and forage crops will consist primarily of lectures covering the fundamental principles of crop production, with special reference to

the adaptation of the various crops to California conditions. A number of practice periods will be devoted to a detailed study of crops in the field and laboratory, including identification of types and varieties, and the selection, preparation and treatment of seed.

Irrigation.—This work consists of lectures and field demonstrations showing the necessity and methods of measuring water; the preparation of land and methods of irrigating alfalfa, orchards, field crops, etc. Special attention is given to the



First prize pen Poland China Barrows under 12 months of age, bred and shown by the University of California at the 1918 International Livestock Show in Chicago.

water requirements of different crops, proper time of irrigation, costs and returns, methods and cost of construction of farm laterals, head gates, concrete pipe lines, etc.; the use of flumes, pipe lines, etc., in the delivery of water; design and construction of pumping plants and reservoirs, and their use in irrigation practice.

The above work will be illustrated by two all-day field demonstrations dealing with practical irrigation problems.

Animal Husbandry.—The work offered in animal husbandry includes lectures and demonstrations dealing with the breeding, feeding, care, management and judging of the various pure breeds and market classes of farm animals.

Dairying.—Students are taught the Babcock test for determining fat in milk and other dairy products and are given thorough practice in its use. Farm separators and the care of milk and cream on the farm are other topics taught in this course.

Veterinary Science.—The care and treatment of sick animals; treatment for common diseases and ailments; minor operations. Special attention is given to hog cholera and tuberculosis; practice work bearing directly on the course is given.



Dwarf Milo Maize is grown extensively at the University Farm; yields of from 3000 to 4000 pounds per acre are commonly obtained.

Agricultural Engineering.—A study of the farm implements and machinery applicable to California agriculture; practice in rope work, power and pumping machinery, gas engines and electric motors; factors concerned in the construction of farm buildings, and the equipment of the farm shop.

In addition to the subjects above mentioned, many special lectures are given, most of them illustrated evening lectures. It is only by a careful study of the daily programmes of the courses which are given below that the prospective student can fully appreciate the opportunities presented for increasing his knowledge and earning power through the instruction offered in these courses.

SCHEDULE OF SHORT COURSES IN GENERAL AGRICULTURE

SEPTEMBER 29 TO NOVEMBER 7, 1919

A. CROP PRODUCTION*First Week*

Monday, September 29:

8-12	} Registration.
1-5	

7:30 Opening session. Music. Addresses: President of the University of California, and Dean of College of Agriculture; Dean of University Farm School, presiding.

Tuesday, September 30:

8-9	Lecture: Origin and Formation of Soils.	C. F. Shaw
9-11	Practice: Soils.	Alfred Smith
11-12	Lecture: The Business Aspects of Farming.	R. L. Adams
1-2	Lecture: Some Fundamental Principles of California Agriculture.	J. W. Gilmore
2-3	Lecture: Wheat Varieties; their Characteristics and Adaptation to California Conditions.	G. W. Hendry
3-5	Practice: The Identification of Wheat Varieties.	G. W. Hendry

Wednesday, October 1:

8-9	Lecture: Classification and Character of Soils.	C. F. Shaw
9-11	Practice: Soils.	Alfred Smith
11-12	Lecture: The Agricultural Library.	Miss A. E. Brown
1-2	Lecture: Barley, Oats and Rye Varieties, their Characteristics and Adaptation to California Conditions.	G. W. Hendry
2-4	Practice: The Identification of Barley and Oat Varieties.	G. W. Hendry
7:30	Public Lecture: Agriculture in the Pajaro and Santa Clara Valleys and the North Coast Counties.	W. T. Clarke

Thursday, October 2:

8-9	Lecture: Physical Properties of Soils.	C. F. Shaw
9-11	Practice: Soils.	Alfred Smith
11-12	Lecture: Establishing the Business of Farming.	R. L. Adams
1-2	Lecture: Culture of the Small Grains with Special Reference to Preparation of the Land and Planting.	G. W. Hendry
2-3	Lecture: Annual vs. Biennial Cropping of California Grain Lands.	G. W. Hendry
3-4	Lecture: Corn Culture.	B. A. Madson

Friday, October 3:

8-9	Lecture: Soil Moisture, Amounts, Movements.	C. F. Shaw
9-11	Practice: Soils.	Alfred Smith
11-12	Lecture: The Agricultural Library.	Miss A. E. Brown
1-2	Lecture: Ornamental Plants for Farmstead Decoration.	J. W. Gregg
2-3	Lecture: Rice Culture.	W. W. Mackie
3-5	Practice: Study of Rice in the Field.	W. W. Mackie
7:30	Public Lecture (Illustrated): Beautifying Home Grounds.	J. W. Gregg

Saturday, October 4:

8-9	Lecture: Soil, Moisture, Alkali, Drainage.	C. F. Shaw
9-11	Practice: Soils.	Alfred Smith
11-12	Lecture: Selection of Land for Irrigation Farming.	S. H. Beckett

Second Week

Monday, October 6:

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|-------|---|---------------|
| 8-9 | Lecture: Sorghum Culture. | B. A. Madson |
| 9-11 | Practice: Types of Corn and Sorghum. | B. A. Madson |
| 11-12 | Lecture: Farm Drainage. | W. W. Weir |
| 1-2 | Lecture: Measurement of Water for Irrigation; Units of Measurement. | S. H. Beckett |
| 2-4 | Practice: Farm Drainage. | W. W. Weir |

Tuesday, October 7:

- | | | |
|-------|---|------------------|
| 8-9 | Lecture: Some Miscellaneous Crops. | J. W. Gilmore |
| 9-11 | Demonstration: Potatoes, Treatment and Culture. | J. W. Gilmore |
| 11-12 | Lecture: Field-Crop Production as a Business. | R. L. Adams |
| 1-3 | Practice: Beans and Bean Culture. | J. W. Gilmore |
| 3-5 | Inspection of Growing Crops at University Farm. | T. F. Tavernetti |

Wednesday, October 8:

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|-------|---|----------------|
| 8-9 | Lecture: Grasses for California. | P. B. Kennedy |
| 9-11 | Practice: Field Study of Grasses. | P. B. Kennedy |
| 11-12 | Lecture: Requirements for Plant Growth. | C. B. Lipman |
| 1-2 | Lecture: Requirements for Plant Growth (continued). | C. B. Lipman |
| 2-4 | Demonstration: Tillage Machinery and Draft of Implements. | L. J. Fletcher |
| 7:30 | Public Lecture: Agriculture in the San Joaquin Valley. | V. C. Bryant |

Thursday, October 9:

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|-------|---|----------------|
| 8-9 | Lecture: Legumes and their Adaptation. | P. B. Kennedy |
| 9-11 | Practice: Legume Demonstration. | P. B. Kennedy |
| 11-12 | Lecture: Relation of Farm Practice to Insect Control. | E. R. de Ong |
| 1-2 | Lecture: Fruit Production as a Business. | R. L. Adams |
| 2-3 | Lecture: Insects of Stored Grain. | E. R. de Ong |
| 3-5 | Practice: Farm Machinery. | L. J. Fletcher |

Friday, October 10:

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|-------|--|-----------------|
| 8-11 | Demonstration: Gas Engines. | L. J. Fletcher |
| 11-12 | Lecture: Alfalfa Culture | B. A. Madson |
| 1-4 | Practice: Measurement of Water for Irrigation; Irrigation Measuring Devices. | S. H. Beckett |
| 7:30 | Public Lecture: Agriculture in the Sacramento Valley, | T. Francis Hunt |

Saturday, October 11:

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|------|--|---------------|
| 8-9 | Lecture: Irrigation of Alfalfa. | S. H. Beckett |
| 9-12 | Practice: Methods of Making Field Determination of Quantity of Irrigation Water to be Applied. | S. H. Beckett |

Third Week

Monday, October 13:

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|-------|--|------------------|
| 8-9 | Lecture: Budding. | W. L. Howard |
| 9-11 | Demonstration: The Farm Shop and Repair of Farm Machinery. | R. C. Ingram |
| 11-12 | Lecture: The Chemical Composition of Soils and its Significance. | C. B. Lipman |
| 1-2 | Lecture: Theory and Practice of the Use of Fertilizers. | C. B. Lipman |
| 2-4 | Lecture and Practice: Weeds and Weed Control. | T. F. Tavernetti |
| 7:30 | Public Lecture: A Lesson from the Two Expositions and its Relation to a Better Community Life. | O. J. Kern |

Tuesday, October 14:

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|-------|---|---------------|
| 8-9 | Lecture: Grafting. | W. L. Howard |
| 9-11 | Demonstration: Materials for the Construction of Farm Buildings. | H. L. Belton |
| 11-12 | Lecture: Farm Bookkeeping. | R. L. Adams |
| 1-3 | Lecture and Demonstration: Pasture and Range Plants Poisonous to Livestock. | P. B. Kennedy |
| 3-5 | Practice: Visit to University Farm Orchard. | W. L. Howard |

Wednesday, October 15:

- | | | |
|-------|---|---------------|
| 8-9 | Lecture: Nursery Stock. | W. L. Howard |
| 9-10 | Lecture: Vegetable Gardening. | S. S. Rogers |
| 10-11 | Lecture: Propagation of the Grape Vine. | F. Flossfeder |
| 11-12 | Lecture: Lime, Gypsum and Alkali. | C. B. Lipman |
| 1-2 | Lecture: Soil Bacteria and the Nitrogen Supply. | C. B. Lipman |
| 2-4 | Conference: Vegetable Gardening. | S. S. Rogers |
| 7:30 | Public Lecture: Agriculture in the Southern Coast Counties. | V. C. Bryant |

Thursday, October 16:

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|-------|---|---------------|
| 8-9 | Lecture: Tree and Fruit Diseases. | W. P. Tufts |
| 9-10 | Lecture: Planting and Care of Young Vineyard. | F. Flossfeder |
| 10-11 | Lecture: Bean and Pea Weevil. | E. R. de Ong |
| 11-12 | Lecture: Markets and Marketing. | R. L. Adams |
| 1-2 | Lecture: Diseases of Cereals. | R. E. Smith |
| 2-3 | Lecture: Windbreaks on the Farm. | W. Metcalf |
| 3-5 | Lecture and practice: Orchard Insects. | E. R. de Ong |

Friday, October 17:

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|-------|--|-----------------|
| 8-9 | Lecture: Tree and Fruit Diseases. | W. P. Tufts |
| 9-11 | Practice: Irrigation of Orchards. | F. J. Veihmeyer |
| 11-12 | Lecture: Quantities or Irrigation Water Retained by Different Soils. | S. H. Beckett |
| 1-3 | Lecture and Discussion: Elements of Beekeeping. | G. A. Coleman |
| 3-4 | Lecture: Problems of the Beginning Farmer. | Thomas F. Hunt |
| 7:30 | Public Lecture: Suggestions from Agriculture of England and France. | Thomas F. Hunt |

Saturday, October 18:

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|-------|--|---------------|
| 8-9 | Lecture: Spraying Calendar. | W. L. Howard |
| 9-10 | Lecture: Pruning the Old Vines. | F. Flossfeder |
| 10-12 | Demonstration: Held in the old vineyard. | F. Flossfeder |

B. ANIMAL HUSBANDRY

Fourth Week

Monday, October 20:

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|-------|---|----------------|
| 8-9 | Lecture: Breeds of Beef Cattle. | G. H. True |
| 9-10 | Lecture: California Feeding Stuffs. | F. W. Woll |
| 10-12 | Practice: Judging Beef Steers. | G. H. True |
| 1-3 | Practice: Judging Beef Cows. | G. H. True |
| 3-5 | Lecture and Practice: Digestive Diseases of Cattle. | F. M. Hayes |
| 7:30 | Public Lecture: The California County Library System. | M. J. Ferguson |

Tuesday, October 21:

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|-------|---|-------------|
| 8-9 | Lecture: Handling the Pure-bred Beef Herd. | G. H. True |
| 9-11 | Practice: Judging Beef Bulls | G. H. True |
| 11-12 | Lecture: Business Phases of Beef Production. | R. L. Adams |
| 1-2 | Lecture: Feeding for Market. | G. H. True |
| 2-4 | Lecture and Practice: Blackleg and Anthrax in Cattle. | F. M. Hayes |

Wednesday, October 22:

8-9	Lecture: Breeds of Sheep.	_____
9-11	Practice: Judging Fat Wethers.	_____
11-12	Library Hour.	
1-2	Lecture: Some Diseases of Sheep.	F. M. Hayes
2-4	Practice: Judging Mutton Sheep.	_____
7:30	Public Lecture: Agriculture in the Imperial and Palo Verde Valleys.	J. W. Gilmore

Thursday, October 23:

8-9	Lecture: Fine-Wool Sheep in California.	_____
9-10	Practice: Judging Fine-Wool Sheep.	_____
10-11	Lecture: Care of the Flock.	_____
11-12	Lecture: Types and Breeds of Draft Horses.	J. I. Thompson
1-3	Lecture and Practice: Treatment of Wounds.	F. M. Hayes
3-5	Practice: Judging Draft Horses.	J. I. Thompson

Friday, October 24:

8-9	Lecture and Practice: The Teeth of the Horse.	F. M. Hayes
9-10	Lecture: Care of Brood Mare and Colt.	J. I. Thompson
10-12	Lecture and Practice: Digestive Diseases of the Horse.	F. M. Hayes
1-2	Lecture: Care and Keeping of Work Stock.	J. I. Thompson
2-5	Slaughter Test and Meat Demonstration.	G. H. True and Assistants
7:30	Public Lecture: Grazing Management on the Open Range.	C. H. Shattuck

Saturday, October 25:

8-9	Lecture: Use of Timber on the Farm.	C. H. Shattuck
9-11	Practice: Judging Horses and Mules.	J. I. Thompson
11-12	Lecture: Poultry on the Farm.	J. E. Dougherty

Fifth Week

Monday, October 27:

8-9	Lecture: Breeds of Dairy Cattle.	E. C. Voorhies
9-10	Lecture: The Babcock Test for Butterfat in Milk.	J. C. Marquardt
10-12	Practice: Judging Dairy Cows.	G. H. True
1-3	Practice: Judging Holstein Cows.	G. H. True
3-5	Lecture: The Abortion Disease in Cattle.	F. M. Hayes

Tuesday, October 28:

8-9	Lecture: Building the Dairy Herd.	E. C. Voorhies
9-11	Practice: Judging Guernsey Cows.	G. H. True
11-12	Lecture: Dairying as a Business.	E. C. Voorhies
1-3	Practice: Dairy Testing Laboratory.	J. C. Marquardt
3-5	Lectures: Silo Construction.	H. L. Belton
	Making and Feeding of Silage.	F. W. Woll

Wednesday, October 29:

8-9	Lecture: Feeding Dairy Cows.	F. W. Woll
9-10	Lecture: Diseases of Newborn Calves.	F. M. Hayes
10-11	Practice: Judging Jersey Cows.	G. H. True
11-12	Lecture: Cow-testing Associations.	E. C. Voorhies
1-3	Practice: Judging Dairy Heifers.	G. H. True
3-4	Lecture: The Improvement of Plants and Animals	H. J. Webber
7:30	Public Lecture: Agriculture in the Citrus Area of California.	H. J. Webber

Thursday, October 30:

8-9	Lecture: Feeding Dairy Calves.	C. V. Castle
9-11	Practice: Judging Dairy Bulls.	G. H. True
11-12	Lecture: Sanitary Dairy Buildings.	C. L. Roadhouse
1-3	Practice: Dairy Testing Laboratory.	J. C. Marquardt
3-5	Lecture and Demonstration: Tuberculosis in Cattle and Hogs.	F. M. Hayes

Friday, October 31:

8-10	Lecture and Practice: Milk Fever, Garget, and Retained Afterbirth in Cattle.	F. M. Hayes
10-11	Lecture: The Babcock Test for Butterfat in Cream.	J. C. Marquardt
11-12	Library Hour.	
1-3	Practice: Dairy Testing Laboratory.	J. C. Marquardt
3-4	Lecture: Milch Goats.	E. C. Voorhies
7:30	Public Lecture: Land Colonization in California.	Elwood Mead

Saturday, November 1:

8-10	Demonstration: Autopsy on Tuberculous Cow.	F. M. Hayes
10-12	Practice: Judging Milch Goats.	E. C. Voorhies

Sixth Week

Monday, November 3:

8-9	Lecture: Hog Cholera.	F. M. Hayes
9-10	Lecture: Market Types and Breeds of Hogs.	J. I. Thompson
10-11	Library Hour.	
11-12	Lecture: Animal Parasites.	W. B. Herms
1-2	Lecture: Insects Affecting Domestic Animals.	W. B. Herms
2-4	Lecture and Practice: Preparation and Use of Hog Cholera Serum.	J. W. Logan
7:30	Public Lecture: Natural History and Handling of Bees.	G. A. Coleman

Tuesday, November 4:

8-9	Lecture: Breeding Herd of Hogs.	J. I. Thompson
9-11	Practice: Judging Market Hogs.	J. I. Thompson
11-12	Lecture: Swine Production as a Business.	C. B. Cunningham
	(Pres. Cal. Swine Breeders' Assoc.)	
1-3	Practice: Judging Duroc-Jersey Hogs.	J. I. Thompson
3-5	Practice: Dairy Testing Laboratory.	J. C. Marquardt

Wednesday, November 5:

8-9	Lecture: Care of Brood Sow and Pigs.	J. I. Thompson
9-10	Lecture: Use of Hand Cream Separator.	S. L. Denning
10-12	Lecture: Causes for Variations in Cream Tests.	S. L. Denning
2-4	Practice: Judging Berkshire Hogs.	J. I. Thompson
7:30	Public Lecture: Agriculture in the Mountainous Counties.	L. A. Barrett

Thursday, November 6:

8-9	Lecture: Feeding Hogs for Market.	J. I. Thompson
9-10	Library Hour.	
10-11	Lecture: Care of Milk and Cream on the Farm.	C. L. Roadhouse
1-3	Demonstration: Pasteurizing and Cooling Milk and Cream.	C. L. Roadhouse
3-5	Practice: Judging Poland-China Hogs.	J. I. Thompson

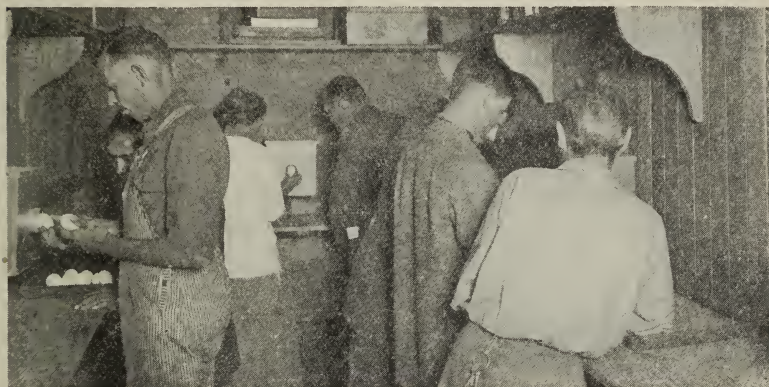
Friday, November 7:

8-9	Lecture: Factors Determining the Value of Butterfat.	S. L. Denning
9-10	Lecture: Hog Houses.	L. J. Fletcher
10-12	Demonstration: Dipping Sheep and Hogs.	J. I. Thompson

II. THE SHORT COURSE IN POULTRY HUSBANDRY

SEPTEMBER 29 TO NOVEMBER 7, 1919

The object of the course in Poultry Husbandry is to give the student a comprehensive and detailed grasp of the fundamental principles of the subject and their practical application to the business side of poultry farming, in order that he may be better fitted to handle successfully the practical, economic problems that are continually arising in the development and



The selecting and grading of market eggs will be treated in detail in the Poultry Husbandry Course.

management of a commercial poultry plant. It is not sufficient that a poultryman know how to hatch, rear, feed, breed, and care for fowls. He must also know how to handle tools and skillfully perform such carpentry work as building hen houses, making coops; how to grow green crops for his fowls; how to irrigate the crops; how to plow and otherwise manipulate different soils for best results; how to operate and care for such farm machinery as gasoline engines, bone cutters, feed mills, alfalfa cutters, field tools, etc.; and, finally, it is important for a poultryman to know how to keep a clear, concise set of accounts, to know the exact cost of operation in every phase of the work and maintain his business on a firm financial basis.

Poultry Management.—This course will treat in detail with the selection and laying out of a poultry ranch; the natural and artificial incubation and brooding of chicks; the selection of fowls for constitutional vigor; the laws of breeding and their application to the building-up of flocks of heavy layers or choice table fowls; poultry-house construction; the making of poultry equipment, such as trap nests, feed hoppers, fattening crates, etc.; the principles of poultry feeding and the best methods of feeding baby chicks, growing stock, laying hens, fowls to be fattened for market, etc.; selecting and grading market eggs; packing and marketing poultry products to the best advantage; mating and handling the breeders; poultry parasites; diseases and sanitation; the general care and management of a poultry ranch.

Incubation and Brooding.—A practice course in operating incubators; keeping records; hatching eggs; brooding, feeding, and caring for young chicks, designed to give students actual practice in artificial hatching and rearing of chicks. Each student will be given an incubator to overhaul and operate for one week of practice before being given any eggs. The incubator will then be set with eggs. When the chicks hatch, each student will place his chicks in a separate pen in the brooder house and care for them till the end of the course. Open only to students taking all the poultry work.

SCHEDULE OF SHORT COURSE IN POULTRY HUSBANDRY

First Week

Monday, September 29:

8-12 }
1-5 } Registration.

7:30 Opening session. Music. Addresses: President of the University of California, and Dean of College of Agriculture; Dean of University Farm School, presiding.

Tuesday, September 30:

8-9 Practice: A Study of Construction and Operation of Incubators.

W. E. Lloyd

10-11 Lecture: History and Distinctive Characteristics of Different Classes of Fowls.

J. E. Dougherty

11-12 Lecture: The Business Aspects of Farming.

R. L. Adams

- 1-2 Lecture: Some Fundamental Principles of California Agriculture. J. W. Gilmore
- 3-5 Practice: Identification and Study of Different Classes of Fowls. E. J. Hauser
- 5-5:30 Practice: Operating Incubators. W. E. Lloyd
- Wednesday, October 1:
- 8-9 Practice: Operating Incubators. W. E. Lloyd
- 10-11 Lecture: History and Distinctive Characteristics of Different Breeds. J. E. Dougherty
- 11-12 Lecture: The Agricultural Library. Miss A. E. Brown
- 12-12:10 Practice: Taking Incubator Temperatures. W. E. Lloyd
- 1-2 Lecture: Barley, Oats and Rye Varieties, Their Characteristics and Adaptation to California Conditions. G. W. Hendry
- 2-3 Practice: Preparation of Hatching Eggs. W. E. Lloyd
- 3-5 Practice: Breeds and Breed Types. E. J. Hauser
- 5-5:30 Practice: Operating Incubators. W. E. Lloyd
- 7:30 Public Lecture: Agriculture in the Pajaro and Santa Clara Valleys and the North Coast Counties. W. T. Clarke
- Thursday, October 2:
- 8-9 Practice: Operating Incubators. W. E. Lloyd
- 10-11 Lecture: Distinctive Characteristics of Different Varieties of Fowls. J. E. Dougherty
- 11-12 Lecture: Establishing the Business of Farming. R. L. Adams
- 12-12:10 Practice: Taking Incubator Temperatures. W. E. Lloyd
- 1-2 Lecture: Culture of the Small Grains with Special Reference to Preparation of the Land and Planting. G. W. Hendry
- 2-3 Practice: Preparation of Hatching Eggs. W. E. Lloyd
- 3-5 Discussion: Poultry Farm Management. J. E. Dougherty
- 5-5:30 Practice: Incubation. W. E. Lloyd
- Friday, October 3:
- 8-9 Practice: Incubation, Preparation of Hatching Eggs. W. E. Lloyd
- 10-11 Lecture: Meat and Egg Breeds and Capons, their Value. J. E. Dougherty
- 11-12 Lecture: The Agricultural Library. Miss A. E. Brown
- 12-12:10 Practice: Incubation. W. E. Lloyd
- 1-2 Lecture: Ornamental Plants for Farmstead Decoration. J. W. Gregg
- 2-3 Practice: Preparation of Hatching Eggs. W. E. Lloyd
- 3-5 Practice: Variety Characteristics. E. J. Hauser
- 5-5:30 Practice: Incubation. W. E. Lloyd
- 7:30 Public Lecture (illustrated): Beautifying Home Grounds. J. W. Gregg
- Saturday, October 4:
- 8-11 Practice: Incubation: Setting the Eggs. W. E. Lloyd
- 11-12 Lecture: Selection of Land for Irrigation Farming. S. H. Beckett
- 12-12:10 Practice: Incubation. W. E. Lloyd
- 5-5:30 Practice: Incubation. W. E. Lloyd

Second Week

Monday, October 6:

- 8-9 Practice: Incubation—Third day.
- 10-11 Lecture: Age, Sex and Vigor in Poultry. J. E. Dougherty
- 11-12 Lecture: Farm Drainage. W. W. Weir
- 12-12:10 Practice: Incubation.
- 1-2 Lecture: Measurement of Water for Irrigation; Units of Measurement. S. H. Beckett
- 2-4 Practice: Farm Drainage. W. W. Weir
- 5-5:30 Practice: Incubation.

Tuesday, October 7:

- 8-9 Practice: Incubation—Fourth day.
 10-11 Lecture: Killing and Picking Fowls for Market. J. E. Dougherty
 11-12 Lecture: Field-Crop Production as a Business. R. L. Adams
 12-12:10 Practice: Incubation.
 1-3 Practice: Beans and Bean Culture. J. W. Gilmore
 3-5 Practice: Age, Sex and Vigor Indications. E. J. Hauser
 5-5:30 Practice: Incubation.

Wednesday, October 8:

- 8-9 Practice: Incubation—Fifth day.
 9-11 Clinic: Poultry Diseases. J. R. Beach
 11-12 Lecture: Requirements for Plant Growth. C. B. Lipman
 12-12:10 Practice: Incubation.
 1-2 Lecture: Requirements for Plant Growth (continued). C. B. Lipman
 3-5 Practice: Study of Structure of an Egg. E. J. Hauser
 5-5:30 Practice: Incubation.
 7:30 Public Lecture: Agriculture in the San Joaquin Valley. V. C. Bryant

Thursday, October 9:

- 8-9 Practice: Incubation—Sixth day.
 9-10 Practice: Test Eggs First Time. W. E. Lloyd
 10-11 Lecture: Principles of Incubation. J. E. Dougherty
 11-12 Lecture: Relation of Farm Practice to Insect Control. E. R. de Ong
 12-12:10 Practice: Incubation.
 1-2 Library Hour.
 2-3 Lecture: Insects of Stored Grain. E. R. de Ong
 3-5 Discussion: Poultry Farm Management. J. E. Dougherty
 5-5:30 Practice: Incubation.

Friday, October 10:

- 8-9 Practice: Incubation—Seventh day.
 9-10 Practice: Test Eggs First Time. W. E. Lloyd
 10-11 Lecture: How to Operate an Incubator. J. E. Dougherty
 11-12 Lecture: Alfalfa Culture B. A. Madson
 12-12:10 Practice: Incubation.
 1-5 Practice: Killing, Picking and Dressing Fowls for Market. W. E. Lloyd
 5-5:30 Practice: Incubation.
 7:30 Public Lecture: Agriculture in the Sacramento Valley. T. Francis Hunt

Saturday, October 11:

- 8-9 Practice: Incubation—Eighth day.
 9-12 Practice: Methods of Making Field Determination of Quantity of Irrigation Water to be Applied. S. H. Beckett
 12-12:10 Practice: Incubation.
 5-5:30 Practice: Incubation.

Third Week

Monday, October 13:

- 8-9 Practice: Incubation—Tenth day.
 9-11 Demonstration: The Farm Shop and Repair of Farm Machinery. R. C. Ingram
 11-12 Lecture: The Chemical Composition of Soils and its Significance. C. B. Lipman
 12-12:10 Practice: Incubation.
 1-2 Lecture: Theory and Practice of the Use of Fertilizers. C. B. Lipman
 3-5 Practice: Caponizing. W. E. Lloyd
 5-5:30 Practice: Incubation.
 7:30 Public Lecture: A Lesson from the Two Expositions and its Relation to a Better Community Life. O. J. Kern

Tuesday, October 14:

- 8-9 Practice: Incubation—Eleventh day.
- 10-11 Lecture: The Selection of Incubators and Brooders. J. E. Dougherty
- 11-12 Lecture: Farm Bookkeeping. R. L. Adams
- 12-12:10 Practice: Incubation.
- 1-3 Lecture and Demonstration: Pasture and Range Plants Poisonous to Livestock. P. B. Kennedy
- 3-5 Practice: Judging and Candling Eggs. E. J. Hauser
- 5-5:30 Practice: Incubation.

Wednesday, October 15:

- 8-9 Practice: Incubation—Twelfth day.
- 9-10 Lecture: Vegetable Gardening. S. S. Rogers
- 10-11 Lecture: Brooding Chicks. J. E. Dougherty
- 11-12 Lecture: Lime, Gypsum and Alkali. C. B. Lipman
- 12-12:10 Practice: Incubation.
- 1-2 Lecture: Soil Bacteria and the Nitrogen Supply. C. B. Lipman
- 3-5 Practice: Packing Eggs for Shipment. E. J. Hauser
- 5-5:30 Practice: Incubation.
- 7:30 Public Lecture: Agriculture in the Southern Coast Counties. V. C. Bryant

Thursday, October 16:

- 8-9 Practice: Incubation—Thirteenth day.
- 10-11 Lecture: Brooding and Rearing Young Stock. J. E. Dougherty
- 11-12 Lecture: Markets and Marketing. R. L. Adams
- 12-12:10 Practice: Incubation.
- 1-2 Library Hour.
- 2-3 Lecture: Windbreaks on the Farm. W. Metcalf
- 3-5 Discussion: Poultry Farm Management. J. E. Dougherty
- 5-5:30 Practice: Incubation.

Friday, October 17:

- 8-9 Practice: Incubation—Fourteenth day.
- 9-10 Practice: Test Eggs Second Time. W. E. Lloyd
- 10-11 Lecture: Selecting a Poultry Farm. J. E. Dougherty
- 11-12 Lecture: Quantities of Irrigation Water Different Soils Can Retain. S. H. Beckett
- 12-12:10 Practice: Incubation.
- 1-3 Lecture and Discussion: Elements of Beekeeping. G. A. Coleman
- 3-4 Lecture: Problems of the Beginning Farmer. Thomas F. Hunt
- 4-5:30 Practice: Incubation—Test Eggs Second Time.
- 7:30 Public Lecture: Suggestions from Agriculture of England and France. Thomas F. Hunt

Saturday, October 18:

- 8-9 Practice: Incubation—Fifteenth Day.
- 9-12 Lecture and Practice: Planting and Care of the Home Vineyard. F. Flossfeder
- 12-12:10 Practice: Incubation.
- 5-5:30 Practice: Incubation.

Fourth Week

Monday, October 20:

- 8-9 Practice: Incubation—Seventeenth day.
- 10-11 Lecture: Laying Out a Poultry Farm. J. E. Dougherty
- 12-12:10 Practice: Incubation.
- 1-3 Library Hour.
- 3-5 Practice: Study of Different Types of Brooders. E. J. Hauser
- 5-5:30 Practice: Incubation.
- 7:30 Public Lecture: The California County Library System. M. J. Ferguson

Tuesday, October 21:

- 8-9 Practice: Incubation—Eighteenth day.
 10-11 Lecture: Poultry Housing. J. E. Dougherty
 11-12 Lecture: Business Phases of Beef Production. R. L. Adams
 12-12:10 Practice: Incubation.
 1-3 Library Hour.
 3-5 Practice: Making and Applying Lice Powder and Disinfectants. E. J. Hauser
 5-5:30 Practice: Incubation.

Wednesday, October 22:

- 8-9 Practice: Incubation—Nineteenth day.
 10-11 Lecture: Poultry Housing—Laying out a Foundation. J. E. Dougherty
 12-12:10 Practice: Incubation.
 1-3 Clinic: Poultry Diseases. J. R. Beach
 3-5 Practice: Laying out a Foundation. E. J. Hauser
 5-5:30 Practice: Incubation.
 7:30 Public Lecture: Agriculture in the Imperial and Palo Verde Valleys. J. W. Gilmore

Thursday, October 23:

- 8-9 Practice: Incubation—Twentieth day.
 10-11 Lecture: Poultry Housing. J. E. Dougherty
 11-12 Lecture: Types and Breeds of Draft Horses. J. I. Thompson
 12-12:10 Practice: Incubation.
 1-3 Practice: Problems of Poultry House Construction. W. E. Lloyd
 3-5 Discussion: Poultry Farm Management. J. E. Dougherty
 5-5:30 Practice: Incubation.

Friday, October 24:

- 8-9 Practice: Incubation—Twenty-first day.
 9-10 Lecture: Poultry Housing. J. E. Dougherty
 10-12 Practice: Poultry House Design. E. J. Hauser
 12-12:10 Practice: Incubation.
 1-2 Lecture: Care and Keeping of Work Stock. J. I. Thompson
 2-5 Practice: Preparing Brooder Pens for Chicks. W. E. Lloyd
 5-5:30 Practice: Incubation.
 7:30 Public Lecture: Grazing Management on the Open Range. C. H. Shattuck

Saturday, October 25:

- 8-9 Practice: Incubation—Twenty-second day.
 9-12 Practice: Preparing Brooder Pens. W. E. Lloyd
 12-12:10 Practice: Incubation.
 2-5 Practice: Chicks Taken to Brooder.

Fifth Week

Monday, October 27:

- 8-9 Practice: Brooding—Third day. W. E. Lloyd
 9-10 Lecture: Poultry Feeding. J. E. Dougherty
 11-12 Practice: Brooding.
 1-3 Practice: Poultry Housing Problems. E. J. Hauser
 3-5 Practice: Study of Poultry Appliances. W. E. Lloyd
 5-5:30 Practice: Brooding.

Tuesday, October 28:

- 8-9 Practice: Brooding—Fourth day.
 9-10 Lecture: Poultry Feeding. J. E. Dougherty

10-11:30	Practice: Poultry House Design.	E. J. Hauser
11:30-12	Practice: Brooding.	
1-3	Practice: Identification and Study of Poultry Feeds.	E. J. Hauser
3-5	Library Hour.	
5-5:30	Practice: Brooding.	

Wednesday, October 29:

8-9	Practice: Brooding—Fifth day.	
9-10	Lecture: Poultry Feeding.	J. E. Dougherty
10-11:30	Practice: Poultry House Design.	E. J. Hauser
11:30-12	Practice: Brooding.	
1-3	Practice: Problems of Poultry Feeding.	E. J. Hauser
3-4	Lecture: The Improvement of Plants and Animals.	H. J. Webber
5-5:30	Practice: Brooding.	
7:30	Public Lecture: Agriculture in the Citrus Area of California.	H. J. Webber

Thursday, October 30:

8-9	Practice: Brooding—Sixth day.	
9-10	Lecture: Poultry Feeding.	J. E. Dougherty
10-11:30	Practice: Poultry House Design.	E. J. Hauser
11:30-12	Practice: Brooding.	
1-3	Practice: Mixing Poultry Feeds.	W. E. Lloyd
3-5	Discussion: Poultry Farm Management.	J. E. Dougherty
5-5:30	Practice: Brooding.	

Friday, October 31:

8-9	Practice: Brooding—Seventh day.	
9-10	Lecture: Poultry Feeding.	J. E. Dougherty
10-11:30	Practice: Poultry House Design.	E. J. Hauser
11:30-12	Practice: Brooding.	
1-3	Clinic: Ovarian Diseases of Fowls.	J. R. Beach
3-4	Lecture: Milch Goats.	E. C. Voorhies
5-5:30	Practice: Brooding.	
7:30	Public Lecture: Land Colonization in California.	Elwood Mead

Saturday, November 1:

8-9	Practice: Brooding—Eighth day.	
10-11:20	Practice: Judging Milch Goats.	E. C. Voorhies
11:30-12	Practice: Brooding.	
5-5:30	Practice: Brooding.	

Sixth Week

Monday, November 3:

8-9	Practice: Brooding—Tenth day.	
9-10	Lecture: Principles of Poultry Breeding.	J. E. Dougherty
10-11:30	Practice: Poultry House Design.	E. J. Hauser
11:30-12	Practice: Brooding.	
1-2	Lecture: Insects Affecting Domestic Animals.	W. B. Herms
3-5	Practice: Balancing Poultry Rations.	E. J. Hauser
5-5:30	Practice: Brooding.	
7:30	Public Lecture: Natural History and Handling of Bees.	G. A. Coleman

Tuesday, November 4:

8-9	Practice: Brooding—Eleventh day.	
9-10	Lecture: Principles of Poultry Breeding.	J. E. Dougherty

10-11:30	Practice: Poultry House Design.	E. J. Hauser
11:30-12	Practice: Brooding.	
1-3	Practice: Line Breeding.	E. J. Hauser
3-5	Clinic: Poultry Diseases	J. R. Beach
5-5:30	Practice: Brooding.	
Wednesday, November 5:		
8-9	Practice: Brooding—Twelfth day.	
9-10	Lecture: Breeding for Egg and Meat Production.	J. E. Dougherty
10-11:30	Library Hour.	
11:30-12	Practice: Brooding.	
1-5	Practice: Egg-Type Study and Selecting the Laying Hen.	E. J. Hauser
5-5:30	Practice: Brooding.	
7:30	Public Lecture: Agriculture in the Mountainous Counties.	L. A. Barrett
Thursday, November 6:		
8-9	Practice: Brooding—Thirteenth day.	
9-10	Lecture: Marketing Poultry Products.	J. E. Dougherty
10-11:30	Library Hour.	
11:30-12	Practice: Brooding.	
2-3	Lecture: Poultry Literature.	J. E. Dougherty
3-5	Discussion: Poultry Literature.	J. E. Dougherty
5-5:30	Practice: Brooding.	
Friday, November 7:		
8-9	Practice: Brooding—Fourteenth day.	
9-10	Lecture: Diseases and Parasites of Poultry.	J. E. Dougherty
11:30-12	Practice: Brooding.	

NOTE.—Incubation and brooding work will have to be attended to Sundays as well as week days.

III. THE SHORT COURSES IN DAIRY MANUFACTURES

SEPTEMBER 29 TO NOVEMBER 7, 1919

The Dairy Manufactures' Short Courses are designed to meet the needs of those actively engaged in the manufacture of dairy products. The more practical phases of butter, cheese, and ice-cream making are taken up as completely as the time allows. The courses include lectures upon the secretion, composition, and handling of milk, the operation of the Babcock test and other commercial tests, dairy bacteriology, lectures and practice in separation, pasteurization, and ripening of cream, production and use of starters, churning and moisture control in butter, manufacture of California and Cheddar types of cheese, separation of whey, scoring dairy products, ice-cream

making, creamery accounting, creamery management, and dairy mechanics. The first two weeks of the six-weeks course will be devoted exclusively to milk and cream testing, for persons who desire to prepare themselves for positions as testers in milk plants, creameries, dairy ranches, etc. The last four weeks of the course will be devoted to butter and cheese making.

While much of the work in butter and cheese making will be given in common, there will be two separate courses, one of



There are over 120 head of dairy cattle, the following breeds being represented: Holstein-Friesian, Jersey, Guernsey, and Ayrshire, and about fifty head of beef cattle: Shorthorn, Hereford and Aberdeen Angus breeds.

which will take up buttermaking and related subjects, and the other cheesemaking. A part of these courses will consist of lectures on such subjects as dairy cattle, hogs, and alfalfa, which are of interest and importance to producers as well as manufacturers. The two-weeks courses which will follow the six-weeks course will be open to experienced men only. The purpose of these courses is to afford the busy buttermaker and cheesemaker, who cannot get away from his factory for a longer period, an opportunity to 'brush up' and to discuss vital problems.

SCHEDULE OF SHORT COURSES IN DAIRY MANUFACTURES**A. CREAMERYMEN'S COURSE***First Week*

Monday, September 29:

8-12	} Registration.
1-5	

7:30 Opening session. Music. Addresses: President of the University of California, and Dean of College of Agriculture; Dean of University Farm School, presiding.

Tuesday, September 30:

8-9	Lecture: Secretion and Composition of Milk.	C. L. Roadhouse
9-10	Lecture: Babcock Test for Butterfat in Milk.	J. C. Marquardt
10-12	Practice: Testing Laboratory.	S. L. Denning
1-2	Lecture: Babcock Test for Butterfat in Milk (continued).	J. C. Marquardt
2-5	Practice: Milk Testing.	S. L. Denning

Wednesday, October 1:

8-9	Lecture: Babcock Test for Butterfat in Cream.	J. C. Marquardt
9-11	Practice: Cream Testing.	S. L. Denning
11-12	Lecture: The Agricultural Library.	Miss A. E. Brown
1-2	Lecture: Babcock Test for Skim Milk, Whey and Buttermilk.	J. C. Marquardt
2-5	Practice: Checking Losses in Skim Milk, Whey and Buttermilk.	S. L. Denning
7:30	Public Lecture: Agriculture in the Pajaro and Santa Clara Valleys and the North Coast Counties.	W. T. Clarke

Thursday, October 2:

8-10	Lecture and Demonstration: Milk and Cream Sampling.	H. S. Baird
10-12	Practice: Analysis of Milk and Cream Samples.	J. C. Marquardt
1-2	Lecture: Dairy Arithmetic.	C. M. Titus
2-5	Practice: Different Methods of Testing Milk and Cream.	S. L. Denning

Friday, October 3:

8-9	Lecture: Babcock Test for Fat in Butter and Ice Cream.	J. C. Marquardt
9-11	Practice: Butter and Ice Cream Testing.	S. L. Denning
11-12	Lecture: The Agricultural Library.	Miss A. E. Brown
1-2	Lecture: Milk and Cream Acidity Tests.	J. C. Marquardt
2-5	Practice: Acidity Testing.	S. L. Denning
7:30	Public Lecture (illustrated): Beautifying Home Grounds.	J. W. Gregg

Saturday, October 4:

8-9	Lecture: Use of Lactometer in Milk Examinations.	J. C. Marquardt
9-11	Practice: Milk Analysis.	S. L. Denning
11-12	Lecture: Use of Lactometer (continued)	J. C. Marquardt

Second Week

Monday, October 6:

8-9	Lecture and Demonstration: Why Cream Tests Vary.	S. L. Denning
9-12	Practice: Cream Testing.	J. C. Marquardt
1-2	Lecture: Common Tests Used in Cheesemaking.	H. S. Baird
2-5	Practice: Milk Grading.	C. L. Roadhouse

Tuesday, October 7:

8-9	Lecture: Moisture Tests for Butter.	S. L. Denning
9-11	Practice: Testing Butter for Moisture.	J. C. Marquardt
11-12	Lecture: Tests for Salt in Butter.	S. L. Denning
1-2	Lecture: Dairy Arithmetic.	C. M. Titus
2-5	Practice: Testing Butter for Salt.	J. C. Marquardt

Wednesday, October 8:

8-9	Lecture: Tests for Preservatives and Sediment in Milk.	J. C. Marquardt
9-11	Practice: Detecting Preservatives in Milk.	S. L. Denning
11-12	Lecture: The State Dairy Laws.	C. L. Roadhouse
1-2	Lecture: Tests for Moisture and Fat in Cheese.	H. S. Baird
2-5	Practice: Cheese Analysis.	J. C. Marquardt
7:30	Public Lecture: Agriculture in the San Joaquin Valley.	V. C. Bryant

Thursday, October 9:

8-9	Lecture: Creamery and Cheese Factory Reports.	S. L. Denning
9-11	Practice: Milk and Cream Testing.	J. C. Marquardt
11-12	Lecture: Reporting the Patrons' Tests.	H. S. Baird
1-2	Lecture: Application of Babcock Test.	C. L. Roadhouse
2-5	Practice: Composite Sampling.	J. C. Marquardt

Friday, October 10:

8-9	Lecture: Creamery Over-run.	S. L. Denning
9-11	Practice: Determining the Relation between Composition of Butter and Over-run.	J. C. Marquardt
11-12	Lecture: Making Returns to the Patron.	H. S. Baird
1-2	Lecture: Plans and Equipment for Testing Room.	J. C. Marquardt
2-5	Practice: Competitive Testing.	J. C. Marquardt
7:30	Public Lecture: Agriculture in the Sacramento Valley.	T. Francis Hunt

Saturday, October 11:

Visit to Milk and Cream Testing Laboratories.

Third Week

Monday, October 13:

8-9	Lecture: Ice Cream as a Creamery Side Line.	S. L. Denning
9-12	Practice: Creamery.	J. C. Marquardt
1-2	Lecture: Bacteria, their Nature and Habits.	F. M. Hayes
2-5	Practice: Creamery.	S. L. Denning
7:30	Public Lecture: A Lesson from the Two Expositions and its Relation to a Better Community Life.	O. J. Kern

Tuesday, October 14:

8-9	Lecture: Handling and Standardizing Cream for Ice Cream Making.	S. L. Denning
9-12	Practice: Creamery.	J. C. Marquardt
1-2	Lecture: Creamery Accounting.	S. L. Denning
2-5	Practice: Soldering.	L. J. Fletcher

Wednesday, October 15:

8-9	Lecture: Refrigeration Machinery.	L. J. Fletcher
9-12	Practice: Creamery.	S. L. Denning
1-2	Lecture: Steam Boilers.	L. J. Fletcher
2-5	Practice: Creamery.	S. L. Denning
7:30	Public Lecture: Agriculture in the Southern Coast Counties.	V. C. Bryant

Thursday, October 16:

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| 8-9 | Lecture: Method of Securing Sweet Cream for Ice Cream. | C. L. Roadhouse |
| 9-11 | Practice: Creamery. | J. C. Marquardt |
| 11-12 | Lecture: Markets and Marketing. | R. L. Adams |
| 1-2 | Lecture: Grading of Cream. | S. L. Denning |
| 2-4 | Lecture and Practice: Studying Bacteria in Milk. | F. M. Hayes |

Friday, October 17:

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|------|---|-----------------|
| 8-9 | Lecture: Starters. | S. L. Denning |
| 9-12 | Practice: Creamery. | J. C. Marquardt |
| 1-2 | Lecture: Sources of Bacteria Commonly Found in Milk. | F. M. Hayes |
| 2-3 | Practice: Creamery. | S. L. Denning |
| 3-4 | Lecture: Problems of the Beginning Farmer. | Thomas F. Hunt |
| 7:30 | Public Lecture: Suggestions from Agriculture of England and France. | Thomas F. Hunt |

Saturday, October 18:

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| 8-9 | Lecture: Pasteurization of Cream. | S. L. Denning |
| 9-12 | Practice: Creamery. | J. C. Marquardt |

Fourth Week

Monday, October 20:

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| 8-11 | Practice: Creamery. | S. L. Denning |
| 11-12 | Lecture: Constituents of Ice Cream. | H. S. Baird |
| 1-5 | Practice: Creamery. | H. Dons |
| 7:30 | Public Lecture: The California County Library System. | M. J. Ferguson |

Tuesday, October 21:

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| 8-9 | Lecture: Cold Storage Room Construction. | L. J. Fletcher |
| 9-12 | Practice: Creamery. | J. C. Marquardt |
| 1-2 | Lecture: Ripening. | S. L. Denning |
| 2-5 | Practice: Belt Lacing. | L. J. Fletcher |

Wednesday, October 22:

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| 8-9 | Discussion. | C. L. Roadhouse |
| 9-11 | Lecture and Practice: Disease Germs in Milk. | F. M. Hayes |
| 11-12 | Lecture: Churning Cream. | S. L. Denning |
| 1-2 | Lecture: Washing, Working and Salting Butter. | S. L. Denning |
| 2-5 | Practice: Creamery. | J. C. Marquardt |
| 7:30 | Public Lecture: Agriculture in the Imperial and Palo Verde Valleys. | J. W. Gilmore |

Thursday, October 23:

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|-------|--------------------------------------|-----------------|
| 8-9 | Lecture: Moisture Control in Butter. | S. L. Denning |
| 9-11 | Practice: Creamery. | J. C. Marquardt |
| 11-12 | Lecture: Packing Butter for Market. | S. L. Denning |
| 1-2 | Lecture: Butter Score Card. | S. L. Denning |
| 2-5 | Practice: Creamery. | J. C. Marquardt |

Friday, October 24:

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| 8-11 | Practice: Creamery. | S. L. Denning |
| 11-12 | Lecture: Classification of Ice Cream and Other Frozen Dairy Products. | H. S. Baird |
| 1-2 | Lecture: The Inspection of Butter for U. S. Navy. | J. C. Marquardt |
| 2-5 | Slaughter Test and Meat Demonstration. | G. H. True and Assistants |
| 7:30 | Public Lecture: Grazing Management on the Open Range. | C. H. Shattuck |

Saturday, October 25:

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| 8-9 | Lecture: Creamery Organization. | S. L. Denning |
| 9-12 | Practice: Creamery. | J. C. Marquardt |

Fifth Week

Monday, October 27:

8-9	Lecture: Preparing the Mix and Freezing Ice Cream.	H. S. Baird
9-10	Lecture: Creamery Plans.	S. L. Denning
10-12	Practice: Judging Dairy Cows.	G. H. True
1-2	Lecture: Methods of Holding and Handling Ice Cream.	H. S. Baird
2-5	Lecture and Practice: The Scoring of Dairies.	C. L. Roadhouse

Tuesday, October 28:

8-9	Lecture: Building the Dairy Herd.	E. C. Voorhies
9-10	Lecture: Fancy Ice Creams, Ices and Sherberts.	H. S. Baird
10-11	Lecture and Practice: Butter Judging.	S. L. Denning
11-12	Lecture: Dairying as a Business.	E. C. Voorhies
1-3	Practice: Creamery.	S. L. Denning
3-5	Lectures: Silo Construction.	H. L. Belton
	Making and Feeding of Silage.	F. W. Woll

Wednesday, October 29:

8-9	Lecture: Feeding Dairy Cows.	F. W. Woll
9-11	Practice: Creamery.	J. C. Marquardt
11-12	Lecture: Cow-testing Associations.	E. C. Voorhies
1-3	Practice: Judging Dairy Heifers.	G. H. True
3-4	Lecture: Creamery Equipment.	S. L. Denning
7:30	Public Lecture: Agriculture in the Citrus Area of California.	
		H. J. Webber

Thursday, October 30:

8-9	Lecture: Feeding Dairy Calves.	C. V. Castle
9-11	Practice: Judging Dairy Bulls.	G. H. True
11-12	Lecture: Sanitary Dairy Buildings.	C. L. Roadhouse
1-3	Practice: Creamery.	S. L. Denning
3-5	Lecture and Demonstration: Tuberculosis in Cattle and Hogs.	
		F. M. Hayes

Friday, October 31:

8-10	Practice: Creamery.	J. C. Marquardt
10-11	Lecture: Market Grades of Butter.	S. L. Denning
11-12	Library Hour.	
1-3	Practice: Creamery.	S. L. Denning
3-4	Lecture: Milch Goats.	E. C. Voorhies
7:30	Public Lecture: Land Colonization in California.	Elwood Mead

Saturday, November 1:

8-10	Demonstration: Autopsy on Tuberculous Cow.	F. M. Hayes
10-12	Practice: Judging Milch Goats.	E. C. Voorhies

Sixth Week

Monday, November 3:

8-9	Lecture: Methods Used for Calculating Swell in Ice Cream.	S. L. Denning
9-10	Lecture: Market Types and Breeds of Hogs.	J. I. Thompson
10-11	Library Hour.	
11-12	Lecture: Bacteria in their Relation to Dairy Products.	C. L. Roadhouse
1-2	Lecture: Types of Ice Cream Freezers.	H. S. Baird
2-5	Practice: Creamery.	S. L. Denning
7:30	Public Lecture: Natural History and Handling of Bees.	G. A. Coleman

Tuesday, November 4:

8-9	Lecture: Breeding Herd of Hogs.	J. I. Thompson
9-12	Practice: Creamery.	S. L. Denning
1-2	Illustrated Lecture: The Dairy Manufacturing Industry.	C. L. Roadhouse
2-5	Practice: Pipe Fitting.	L. J. Fletcher

Wednesday, November 5:

8-9	Lecture: Milk and Cream Routes.	C. L. Roadhouse
9-12	Practice: Creamery.	J. C. Marquardt
1-2	Lecture: Soft Cheeses.	H. S. Baird
2-5	Practice: Creamery.	S. L. Denning
7:30	Public Lecture: Agriculture in the Mountainous Counties.	L. A. Barrett

Thursday, November 6:

8-9	Lecture: Feeding Hogs for Market.	J. I. Thompson
9-10	Lecture: The Dairy Manufacturing Profession.	C. L. Roadhouse
10-11	Lecture: Care of Milk and Cream on the Farm.	C. L. Roadhouse
11-12	Lecture: Plans and Equipment for the Ice Cream Factory.	H. S. Baird
1-2	Lecture: Casein Manufacture.	S. L. Denning
2-5	Practice: Babbiting.	L. J. Fletcher

Friday, November 7:

8-9	Lecture: Factors Determining the Value of Butterfat.	S. L. Denning
9-12	Practice: Creamery.	J. C. Marquardt
1-2	Lecture: Creamery Management.	H. S. Baird
2-4	Practice: Judging Market Butter.	S. L. Denning

Saturday, November 8:

Visit to the Dairy Manufacturing Plants in the San Joaquin Valley.

B. CHEESEMAKERS' COURSE

First Week

Monday, September 29:

8-12	} Registration.	
1-5		
7:30	Opening session. Music. Addresses: President of the University of California, and Dean of College of Agriculture; Dean of University Farm School, presiding.	

Tuesday, September 30:

8-9	Lecture: Secretion and Composition of Milk.	C. L. Roadhouse
9-10	Lecture: Babcock Test for Butterfat in Milk.	J. C. Marquardt
10-12	Practice: Testing Laboratory.	S. L. Denning
1-2	Lecture: Babcock Test for Butterfat in Milk (continued).	J. C. Marquardt
2-5	Practice: Milk Testing.	S. L. Denning

Wednesday, October 1:

8-9	Lecture: Babcock Test for Butterfat in Cream.	J. C. Marquardt
9-11	Practice: Cream Testing.	S. L. Denning
11-12	Lecture: The Agricultural Library.	Miss A. E. Brown
1-2	Lecture: Babcock Test for Skim Milk, Whey and Buttermilk.	J. C. Marquardt
2-5	Practice: Checking Losses in Skim Milk, Whey and Buttermilk.	S. L. Denning
7:30	Public Lecture: Agriculture in the Pajaro and Santa Clara Valleys and the North Coast Counties.	W. T. Clarke

Thursday, October 2:

8-10	Lecture and Demonstration: Milk and Cream Sampling.	H. S. Baird
10-12	Practice: Analysis of Milk and Cream Samples.	J. C. Marquardt
1-2	Lecture: Dairy Arithmetic.	C. M. Titus
2-5	Practice: Different Methods of Testing Milk and Cream.	S. L. Denning

Friday, October 3:

8-9	Lecture: Babcock Test for Fat in Butter and Ice Cream.	J. C. Marquardt
9-11	Practice: Butter and Ice Cream Testing.	S. L. Denning
11-12	Lecture: The Agricultural Library.	Miss A. E. Brown
1-2	Lecture: Milk and Cream Acidity Tests.	J. C. Marquardt
2-5	Practice: Acidity Testing.	S. L. Denning
7:30	Public Lecture (illustrated): Beautifying Home Grounds.	J. W. Gregg

Saturday, October 4:

8-9	Lecture: Use of the Lactometer in Milk Examinations.	J. C. Marquardt
9-11	Practice: Milk Analysis.	S. L. Denning
11-12	Lecture: Use of Lactometer (continued)	J. C. Marquardt

Second Week

Monday, October 6:

8-9	Lecture and Demonstration: Why Cream Tests Vary.	S. L. Denning
9-12	Practice: Cream testing.	J. C. Marquardt
1-2	Lecture: Common Tests Used in Cheesemaking.	H. S. Baird
2-5	Practice: Milk Grading.	C. L. Roadhouse

Tuesday, October 7:

8-9	Lecture: Moisture Tests for Butter.	S. L. Denning
9-11	Practice: Testing Butter for Moisture.	J. C. Marquardt
11-12	Lecture: Tests for Salt in Butter.	S. L. Denning
1-2	Lecture: Dairy Arithmetic.	C. M. Titus
2-5	Practice: Testing Butter for Salt.	J. C. Marquardt

Wednesday, October 8:

8-9	Lecture: Tests for Preservatives and Sediment in Milk.	J. C. Marquardt
9-11	Practice: Detecting Preservatives in Milk.	S. L. Denning
11-12	Lecture: The State Dairy Laws.	C. L. Roadhouse
1-2	Lecture: Tests for Moisture and Fat in Cheese.	H. S. Baird
2-5	Practice: Cheese Analysis.	J. C. Marquardt
7:30	Public Lecture: Agriculture in the San Joaquin Valley.	V. C. Bryant

Thursday, October 9:

8-9	Lecture: Creamery and Cheese Factory Reports.	S. L. Denning
9-11	Practice: Milk and Cream Testing.	J. C. Marquardt
11-12	Lecture: Reporting the Patron's Tests.	H. S. Baird
1-2	Lecture: Application of Babcock Test.	C. L. Roadhouse
2-5	Practice: Composite Sampling.	J. C. Marquardt

Friday, October 10:

8-9	Lecture: Creamery Over-run.	S. L. Denning
9-11	Practice: Determining the Relation between Composition of Butter and Over-run.	J. C. Marquardt
11-12	Lecture: Making Returns to the Patron.	H. S. Baird
1-2	Lecture: Plans and Equipment for Testing Room.	J. C. Marquardt
2-5	Practice: Competitive Testing.	J. C. Marquardt
7:30	Public Lecture: Agriculture in the Sacramento Valley.	T. Francis Hunt

Saturday, October 11:

Visit to Milk and Cream Testing Laboratories.

Third Week

Monday, October 13:

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| 8-9 | Lecture: Milk for Cheesemaking. | H. S. Baird |
| 9-12 | Practice: Cheesemaking. | H. Dons |
| 1-2 | Lecture: Bacteria, their Nature and Habits. | F. M. Hayes |
| 2-5 | Practice: Paraffining Cheese. | H. S. Baird |
| 7:30 | Public Lecture: A Lesson from the Two Expositions and its Relation to a Better Community Life. | O. J. Kern |

Tuesday, October 14:

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| 8-9 | Lecture: Cheddar Cheese. | H. S. Baird |
| 9-2 | Practice: Cheesemaking. | H. Dons |
| 2-5 | Practice: Soldering. | L. J. Fletcher |

Wednesday, October 15:

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| 8-9 | Lecture: Refrigeration Machinery. | L. J. Fletcher |
| 9-10 | Lecture: Cheddar Cheese (continued). | H. S. Baird |
| 10-12 | Practice: Cheesemaking. | H. Dons |
| 1-2 | Lecture: Steam Boilers. | L. J. Fletcher |
| 2-5 | Practice: Paraffining Cheese. | H. S. Baird |
| 7:30 | Public Lecture: Agriculture in the Southern Coast Counties. | V. C. Bryant |

Thursday, October 16:

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| 8-9 | Lecture: Cheddar Cheese (continued). | H. S. Baird |
| 9-11 | Practice: Cheesemaking. | H. Dons |
| 11-12 | Lecture: Markets and Marketing. | R. L. Adams |
| 1-2 | Lecture: Judging Cheese. | H. S. Baird |
| 2-4 | Lecture and Practice: Studying Bacteria in Milk. | F. M. Hayes |

Friday, October 17:

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|-------|---|----------------|
| 8-9 | Lecture: Starters. | S. L. Denning |
| 9-10 | Lecture: California (Granular) Cheese. | H. S. Baird |
| 10-12 | Practice: Cheesemaking. | H. Dons |
| 1-2 | Lecture: Sources of Bacteria Commonly Found in Milk. | F. M. Hayes |
| 2-3 | Practice: Paraffining Cheese. | H. Dons |
| 3-4 | Lecture: Problems of the Beginning Farmer. | Thomas F. Hunt |
| 7:30 | Public Lecture: Suggestions from Agriculture of England and France. | Thomas F. Hunt |

Saturday, October 18:

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| 8-9 | Lecture: Jack Cheese. | H. S. Baird |
| 9-4 | Practice: Cheesemaking. | H. Dons |

Fourth Week

Monday, October 20:

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| 8-9 | Lecture: Soft Cheese. | H. S. Baird |
| 9-5 | Practice: Cheesemaking. | J. C. Marquardt |

Tuesday, October 21:

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| 8-9 | Lecture: Cold Storage Room Construction. | L. J. Fletcher |
| 9-10 | Lecture: Fancy Cheese. | H. S. Baird |
| 2-5 | Practice: Belt Lacing. | L. J. Fletcher |

Wednesday, October 22:

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|-------|---|-----------------|
| 8-9 | Discussion. | C. L. Roadhouse |
| 9-11 | Lecture and Practice: Disease Germs in Milk. | F. M. Hayes |
| 11-12 | Practice: Judging Cheese. | H. S. Baird |
| 1-5 | Practice: Cheesemaking. | H. Dons |
| 7:30 | Public Lecture: Agriculture in the Imperial and Palo Verde Valleys. | J. W. Gilmore |

Thursday, October 23:

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| 8-9 | Lecture: Moisture Control in Cheese. | H. S. Baird |
| 9-5 | Practice: Cheesemaking. | H. Dons |

Friday, October 24:

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|------|---|---------------------------|
| 8-9 | Lecture: Cheese Factory Records. | H. S. Baird |
| 9-2 | Practice: Cheesemaking. | H. Dons |
| 2-5 | Slaughter Test and Meat Demonstration. | G. H. True and Assistants |
| 7:30 | Public Lecture: Grazing Management on the Open Range. | C. H. Shattuck |

Saturday, October 25:

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| 8-9 | Lecture: Curing Cheese. | H. S. Baird |
| 9-5 | Practice: Cheesemaking. | H. Dons |

Fifth Week

Monday, October 27:

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|-------|---|-----------------|
| 9-10 | Lecture: Cheese Defects and Causes. | H. S. Baird |
| 10-12 | Practice: Judging Dairy Cows. | G. H. True |
| 1-2 | Discussion. | |
| 2-5 | Lecture and Practice: The Scoring of Dairies. | C. L. Roadhouse |

Tuesday, October 28:

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| 8-9 | Lecture: Building the Dairy Herd. | G. H. True |
| 9-10 | Practice: Handling and Paraffining Cheese. | H. Dons |
| 11-12 | Lecture: Dairying as a Business. | E. C. Voorhies |
| 1-3 | Practice: Judging Cheese. | H. S. Baird |
| 3-5 | Lectures: Silo Construction | L. J. Fletcher |
| | Making and Feeding of Silage. | F. W. Woll |

Wednesday, October 29:

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|-------|---|----------------|
| 8-9 | Lecture: Feeding Dairy Cows. | F. W. Woll |
| 9-11 | Practice: Cheesemaking. | H. S. Baird |
| 11-12 | Lecture: Cow-testing Associations. | E. C. Voorhies |
| 1-3 | Practice: Judging Dairy Heifers. | G. H. True |
| 3-4 | Lecture: Market Grades of Cheese. | H. S. Baird |
| 7:30 | Public Lecture: Agriculture in the Citrus Area of California. | H. J. Webber |

Thursday, October 30:

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|-------|---|-----------------|
| 8-9 | Lecture: Feeding Dairy Calves. | C. V. Castle |
| 9-11 | Practice: Judging Dairy Bulls. | G. H. True |
| 11-12 | Lecture: Sanitary Dairy Buildings. | C. L. Roadhouse |
| 1-3 | Practice: Cheesemaking. | H. Dons |
| 3-5 | Lecture and Demonstration: Tuberculosis in Cattle and Hogs. | F. M. Hayes |

Friday, October 31:

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| 8-10 | Practice: Cheesemaking. | H. Dons |
| 10-11 | Lecture: Cheese Factory Plans. | H. S. Baird |
| 11-12 | Library Hour. | |
| 1-3 | Practice: Handling and Paraffining Cheese. | H. Dons |
| 3-4 | Lecture: Milch Goats. | E. C. Voorhies |
| 7:30 | Public Lecture: Land Colonization in California. | Elwood Mead |

Saturday, November 1:

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| 8-10 | Demonstration: Autopsy on Tuberculous Cow. | F. M. Hayes |
| 10-11 | Practice: Judging Milch Goats. | E. C. Voorhies |

Sixth Week

Monday, November 3:

8-9	Lecture: Cheese Factory Equipment.	H. S. Baird
9-10	Lecture: Market Types and Breeds of Hogs.	J. I. Thompson
10-11	Practice: Judging Cheese.	H. S. Baird
11-12	Lecture: Bacteria in their Relation to Dairy Products.	C. L. Roadhouse
1-5	Practice: Cheesemaking.	H. Dons
7:30	Public Lecture: Natural History and Handling of Bees.	G. A. Coleman

Tuesday, November 4:

8-9	Lecture: Breeding Herd of Hogs.	J. I. Thompson
9-10	Lecture: Separation and Disposition of Whey.	H. S. Baird
10-2	Practice: Cheesemaking.	H. Dons
2-5	Practice: Pipe Fitting.	L. J. Fletcher

Wednesday, November 5:

8-9	Lecture: Milk and Cream Routes.	C. L. Roadhouse
9-12	Practice: Cheesemaking.	H. Dons
1-2	Lecture: Soft Cheeses.	H. S. Baird
2-4	Practice: Handling and Paraffining Cheese.	H. Dons
7:30	Public Lecture: Agriculture in the Mountainous Counties.	L. A. Barrett

Thursday, November 6:

8-9	Lecture: Feeding Hogs for Market.	J. I. Thompson
9-10	Lecture: The Dairy Manufacturing Profession.	C. L. Roadhouse
11-12	Practice: Judging Cheese.	S. L. Denning
1-2	Lecture: Casein Manufacture.	S. L. Denning
2-5	Practice: Babbiting.	L. J. Fletcher

Friday, November 7:

8-9	Lecture: Factors Determining the Value of Butterfat.	S. L. Denning
9-10	Lecture: Selecting a Location for a Cheese Factory.	H. S. Baird
10-4	Practice: Cheese Laboratory.	H. Dons

Saturday, November 8:

Visit to the Dairy Manufacturing Plants in the San Joaquin Valley.

B. TWO-WEEKS COURSES

I. THE GAS TRACTOR SHORT COURSE

SEPTEMBER 16 TO 25, 1919

This course is similar to the Tractor Short Courses held at Davis since 1916, at Riverside in 1918 and 1919, and Visalia in 1918, with a total enrollment during 1918 of 480. Registration is limited to 180. The enrollment is made in the order of registration. A fee of \$1 is charged.

The Gas Tractor Short Course will consist of lectures on the principles and practice of the gas tractor and practice work in adjusting, repairing, care and operation.

At least twelve of the best makes of tractors will be available for instruction, each of which will be in charge of an experienced service man.

For detailed information write *Dean of University Farm School, Davis, California.*

(A similar course will be held at Riverside in February, 1920. For detailed information address *Director of Citrus Experiment Station, Riverside, California.*)

SCHEDULE OF THE GAS TRACTOR SHORT COURSE

STAFF OF INSTRUCTORS

L. J. FLETCHER

H. L. BELTON

R. C. INGRIM

and Special Assistants

R. B. LUNDY

Monday, September 15:

8:00-12:00 Registration.

1:00 Opening session. Address: Dean of University Farm School.
Announcements. Lecture: Gas Engine Principles and Types.

2:30-5:00 Practice Work.

Tuesday, September 16:

8:00-9:15 Lecture: Fuels and Carburetors.

9:15-12:00 Practice: Work as assigned to different groups.

1:00-2:15 Lecture: Carburetor Adjustment.

2:15-5:00 Practice Work.

Wednesday, September 17:

- 8:00-9:15 Lecture: Ignition—High and Low Tension System.
- 9:15-12:00 Practice Work.
- 1:00-2:15 Lecture: Magneto.
- 2:15-5:00 Practice Work.

Thursday, September 18:

- 8:00-9:15 Lecture: Magneto—Care and Adjustment.
- 9:15-12:00 Practice Work.
- 1:00-2:15 Lecture: Governing and Cooling Mechanism.
- 2:15-5:00 Practice Work.

Friday, September 19:

- 8:00-9:15 Lecture: Lubrication.
- 9:15-12:00 Practice Work.
- 1:00-2:15 Lecture: Testing Horsepower Rating.
- 2:15-5:00 Practice Work.

Saturday, September 20:

- 8:00-9:15 Lecture: Tractor Types, Adaptability and Construction.
- 9:15-12:00 Practice Work.
- 1:00-2:15 Lecture: Tractor Motors.
- 2:15-5:00 Practice Work.

Monday, September 22:

- 8:00-9:15 Lecture: Tractor Operation.
- 9:15-12:00 Practice Work.
- 1:00-2:15 Lecture: Valve Timing and Adjustment of Parts.
- 2:15-5:00 Practice Work.

Tuesday, September 23:

- 8:00-9:15 Lecture: Engine Troubles.
- 9:15-12:00 Practice Work.
- 1:00-2:15 Lecture: Tillage Methods.
- 2:15-5:00 Practice Work.

Wednesday, September 24:

- 8:00-9:15 Lecture: Tractor Overhauling.
- 9:15-12:00 Practice Work.
- 1:00-2:15 Lecture: Tractor Overhauling (continued).
- 2:15-5:00 Practice Work.

Thursday, September 25:

- 8:00-9:15 Lecture: Tractor Management—Contracting.
- 9:15-12:00 Practice: Field Work.
- 1:00-2:15 Lecture: Tractor Implements, Plows.
- 2:15-5:00 Practice: Field Work.

The demonstrations and practice work will consist of the following exercises assigned to different groups in turn. Opportunity will be given for each student to do the actual work as far as possible.

Carburetor Adjustment.

Valve Timing.

Magneto Timing.

Ignition Troubles.

Clutch Adjustment.

Gas Engine Testing.

Inspection and operation of several tractors covering several periods.

Belt Lacing.

Repairing and Overhauling.

Babbitting of Bearings.

Pipe Fitting.

Rope and Cable Splicing.

Soldering.

Field practice with tractors, plows, and other tillage machines.

Forge Practice.

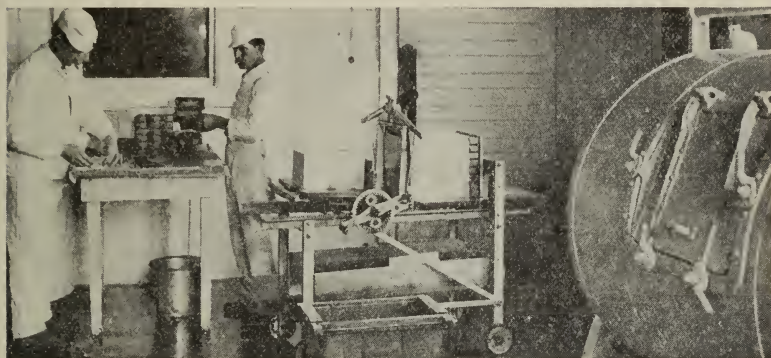
Welding.

Sharpening plowshares.

II. BUTTERMAKERS' COURSE

NOVEMBER 10 TO 22, 1919

Applicants must have had at least six months of creamery experience or the four-months University Farm Creamery Practice Course, or the six-weeks Dairy Manufactures Short Course previous to 1919. The number allowed to register in this course will be limited to twenty.



The Creamery Courses particularly emphasize the practice work.

The first week in this course will be devoted exclusively to problems in buttermaking, with instruction in creamery overrun, systems of payment for butterfat, scoring butter, keeping-quality and marketing of butter, grading cream, starters, pasteurization, creamery practice, cost accounting and business methods. Outside speakers, men engaged in commercial work, will be secured to assist with the instruction.

The latter part of the first week will be devoted to instruction and practice in ice-cream making and the testing of dairy products. The last two days of the course will be devoted to the papers and discussions presented at the Annual Convention of the California Creamery Operators' Association to be held at the University Farm.

SCHEDULE OF BUTTERMAKERS' COURSE*First Week*

Monday, November 10:

- | | | |
|------|---|-----------------|
| 8-12 | Registration. | |
| 1-2 | Lecture: The Buttermaking Profession. | C. L. Roadhouse |
| 2-3 | Lecture: Quality of Cream and Buttermaking. | S. L. Denning |
| 3-5 | Practice: Milk and Cream Testing. | J. C. Marquardt |

Tuesday, November 11:

- | | | |
|-------|---|-----------------|
| 8-10 | Lecture and Demonstration: Moisture and Salt Tests of Butter. | J. C. Marquardt |
| 10-12 | Practice: Analyzing Butter for Moisture and Salt. | J. C. Marquardt |
| 1-2 | Lectures: Starters. | S. L. Denning |
| 2-4 | Practice: Manufacture and Use of Starter. | H. Dons |

Wednesday, November 12:

- | | | |
|------|---|---------------|
| 8-9 | Lecture: Acidity of Cream for Buttermaking. | S. L. Denning |
| 9-12 | Demonstration: Churning. | H. Dons |
| 1-2 | Lecture: Systems of Butter Scoring. | S. L. Denning |
| 2-4 | Practice: Butter Scoring. | H. S. Baird |
| 4-5 | Lecture: The Manufacture of Butter with Special Reference to its Composition. | C. E. Grey |
| 7:30 | Lecture: The Marketing of Butter. | C. E. Grey |

Thursday, November 13:

- | | | |
|-------|---|------------------|
| 8-9 | Lecture: Cream Routes and Hauling. | H. S. Baird |
| 9-11 | Lecture and Demonstration: Nature and Habits of Bacteria in Milk. | F. M. Hayes |
| 11-12 | Lecture: Fermented Milks and Buttermilks. | C. L. Roadhouse |
| 1-2 | Lecture: Pasteurization. | S. L. Denning |
| 2-4 | Demonstration: Pasteurization of Cream. | H. Dons |
| 7:30 | Lecture: The Man the Starter. | H. E. Van Norman |

Friday, November 14:

- | | | |
|-------|---|----------------|
| 8-9 | Lecture: Steam Boilers and Engines. | L. J. Fletcher |
| 9-10 | Lecture: Churning. | S. L. Denning |
| 10-12 | Practice: Buttermaking. | H. Dons |
| 1-2 | Lecture: Washing, Working and Salting Butter. | S. L. Denning |
| 2-4 | Practice: Pasteurization of Cream. | H. Dons |
| 4-5 | Practice: Preparing Ice Cream Mix. | H. S. Baird |

Saturday, November 15:

- | | | |
|-------|---|---------------|
| 8-9 | Lecture: Ice Cream as a Creamery Side Line. | S. L. Denning |
| 9-10 | Lecture: Constituents of Ice Cream. | H. S. Baird |
| 10-12 | Demonstration: Ice Cream Freezing. | H. Dons |

Second Week

Monday, November 17:

- | | | |
|------|---|-----------------|
| 8-9 | Lecture: Moisture Control and Over-run in Butter. | S. L. Denning |
| 9-12 | Demonstration: Controlling the Composition of Butter. | H. Dons |
| 1-2 | Lecture: Packing and Cutting of Butter. | S. L. Denning |
| 2-4 | Practice: Butter Testing. | J. C. Marquardt |
| 4-5 | Lecture: Manufacturing Sweet Cream Butter. | John Sollie |
| 7:30 | Lecture: Market Requirements for California Butter. | John Sollie |

Tuesday, November 18:

- 8-9 Lecture: The Marketing Service of the U. S. Bureau of Markets. H. S. Baird
- 9-10 Lecture: Procedure in Securing Good Cream from the Producer. C. L. Roadhouse
- 10-12 Practice: Buttermaking. S. L. Denning
- 1-2 Lecture: Creamery Organization. S. L. Denning
- 2-4 Practice: Scoring of Butter. H. S. Baird
- 4-5 Lecture: Butter Standardization. S. L. Denning

Wednesday, November 19:

- 8-9 Lecture: Soft Cheese. H. S. Baird
- 9-11 Demonstration: Manufacture and Preparation of Cottage Cheese for the Market. H. Dons
- 11-12 Lecture: Creamery Management. S. L. Denning
- 1-2 Lecture: Creamery Plans and Equipment. S. L. Denning
- 2-4 Demonstration: Care of Creamery Equipment. L. J. Fletcher
- 4-5 Lecture: Factors Influencing the Price of Butterfat. C. L. Roadhouse
- 7:30 Lecture: Utilization of Creamery By-Products. G. E. Frevert

Thursday, November 20:

- 9-11 Third Scoring of Educational Butter and Cheese Scoring Contest.
- 11-12:30 Meeting of California Butter, Cheese and Ice Cream Makers' Association. California Creamery Operators' Association Convention opens.

Friday, November 21:

California Creamery Operators' Association Convention.

Saturday, November 22:

California Creamery Operators' Association Convention. Banquet.

III. CHEESEMAKERS' COURSE

DECEMBER 1 TO 13, 1919

The two-weeks Cheesemakers' Short Course is intended for men having had previous experience in a cheese factory or who have taken the six-weeks Cheesemakers' Short Course previous to 1919. The recent developments require that men engaged in cheesemaking have more experience and technical training than has been required in the past. This course is designed to train men to meet these requirements. Instruction is given in the manufacture of Cheddar, California Granular, Jack, Neufchatel, Cottage and other types of cheese which are meeting with favor on the California market. A study of the market requirements for the different types of cheese will be made and an opportunity will be given to score cheese according to these requirements. Number limited to sixteen.

SCHEDULE OF CHEESEMAKERS' COURSE

Monday, December 1:		<i>First Week</i>	
8-9	Registration.		
9-10	Lecture: Milk for Cheesemaking.		H. S. Baird
10-5	Practice: Cheesemaking.		J. C. Marquardt
Tuesday, December 2.			
8-9	Lecture: Cheddar Cheese.		H. S. Baird
9-10	Lecture: Acid Tests and their Application.		J. C. Marquardt
10-4	Practice: Cheesemaking.		H. Dons
4-5	Lecture: Secretion and Composition of Milk.		C. L. Roadhouse
Wednesday, December 3:			
8-9	Lecture: Cheddar Cheese (continued).		H. S. Baird
9-10	Lecture: Babcock Test for Milk and Other Dairy Products.		J. C. Marquardt
10-2	Practice: Cheesemaking.		H. Dons
2-4	Practice: Testing Laboratory.		J. C. Marquardt
Thursday, December 4:			
8-9	Lecture: California (Granular) Cheese.		H. S. Baird
9-11	Lecture and Demonstration: Habits and Source of Bacteria.		F. M. Hayes
11-2	Practice: Cheesemaking.		H. Dons
2-4	Practice: Judging Dairy Cows.		G. H. True
Friday, December 5:			
8-9	Lecture: Jack Cheese.		H. S. Baird
9-10	Lecture: Herd Testing.		C. V. Castle
10-4	Practice: Cheesemaking.		J. C. Marquardt
Saturday, December 6:			
8-9	Lecture: Moisture Control in Cheese.		H. S. Baird
9-10	Lecture: Cheese Factory Records.		S. L. Denning
10-4	Practice: Cheesemaking.		J. C. Marquardt
Monday, December 8:		<i>Second Week</i>	
8-9	Lecture and Practice: Scoring Cheese.		H. S. Baird
9-2	Practice: Cheesemaking.		J. C. Marquardt
2-4	Practice: Judging Hogs.		J. I. Thompson
Tuesday, December 9:			
8-9	Lecture: Curing Cheese.		H. S. Baird
9-10	Lecture: Feeding Dairy Calves.		C. V. Castle
10-2	Practice: Cheesemaking.		H. Dons
2-4	Practice: Testing Laboratory.		J. C. Marquardt
Wednesday, December 10:			
8-9	Lecture: Separating and Disposing of Whey.		H. S. Baird
9-10	Lecture: Feeding Dairy Cows.		F. W. Woll
10-3	Practice: Cheesemaking.		J. C. Marquardt
3-4	Practice: Judging Cheese.		S. L. Denning
Thursday, December 11:			
8-9	Lecture: Market Grades of Cheese.		H. S. Baird
9-10	Lecture: Steam Boilers and Engines.		L. J. Fletcher
10-3	Practice: Cheesemaking.		J. C. Marquardt
3-4	Lecture: Bacteria and Cheesemaking.		C. L. Roadhouse
Friday, December 12:			
8-9	Lecture: Cheese Factory Plans.		H. S. Baird
9-10	Lecture: Common Ailments of Dairy Cattle.		F. M. Hayes
10-2	Practice: Cheesemaking.		H. Dons
2-4	Practice: Testing Laboratory.		J. C. Marquardt

Saturday, December 13:

8-9	Lecture: Soft Cheeses.	H. S. Baird
9-10	Lecture: Methods of Paying for Milk for Cheesemaking.	H. S. Baird
10-4	Practice: Cheesemaking.	J. C. Marquardt

BEEKEEPERS' SHORT COURSES

IV. BEEKEEPING FOR BEGINNERS

UNIVERSITY FARM, DAVIS, November 10-15

A course of instruction in the fundamentals of beekeeping including practical instruction in the use of apparatus.

SCHEDULE OF SHORT COURSE FOR BEGINNERS

Monday, November 10: (Registration previous to 1 P.M.)

1-2	The Amateur Beekeeper and What He Has to Learn.	Geo. A. Coleman
2-3	Beekeeping as a Vocation for Women.	Mrs. Florence Richardson
3-5	Equipment (illustrated).	E. R. de Ong
7:30	Opening: Music. Addresses by Dean Van Norman, Professor Woodworth.	

Tuesday, November 11:

8-9	Getting a Start with Bees.	E. R. de Ong
9-10	Management of the Apiary.	Mrs. Richardson
10-11	The Relation of Bees to Fruitgrowing.	Geo. A. Coleman
11-12	Order and System in the Apiary.	E. R. de Ong
1-3	Handling Bees (illustrated).	Mrs. Richardson
3-5	Shop work (practice).	E. R. de Ong
7:30	Anatomy and Physiology of the Honey Bee (illustrated).	Geo. A. Coleman

Wednesday, November 12:

8-9	The Care of Bees in Winter.	Mrs. Richardson
9-10	The Beekeeper's Library.	E. R. de Ong
10-11	Honey Plants of California.	Geo. A. Coleman
11-12	Swarming and Swarm Control.	E. R. de Ong
1-3	Extracted Honey Apparatus.	Oliver Parks
3-5	Library Practice.	
7:30	The Apiary Site and Some California Apiaries (illustrated).	Geo. A. Coleman

Thursday, November 13:

8-9	Building up Colonies in Spring.	Mrs. Richardson
9-10	Comb Honey Production.	E. R. de Ong
10-11	Queen Breeding.	Geo. A. Coleman
11-12	Keeping Records.	Mrs. Richardson
1-3	Queen Breeding Methods (illustrated).	Oliver Parks
3-5	Comb Honey, Methods of Production (illustrated).	E. R. de Ong
7:30	Undeveloped Territory in California.	Geo. A. Coleman

Friday, November 14:

8-10	Bee Diseases and Control.	Geo. A. Coleman
10-12	Question Box.	Mrs. Richardson
1-3	General Apiary Work.	Oliver Parks
3-5	Inspection of University Farm.	
7:30	Social.	

Saturday, November 15:

8-12	Visits to Apiaries.	
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V. COURSE FOR COMMERCIAL HONEY PRODUCERS

NOVEMBER 17 TO 22

The course of advanced instruction, comprising a more detailed discussion of modern methods of honey production for experienced honey producers, will follow immediately the "Beginners' Course."*



A feature of the course in Horticulture will be the complete manner in which the subject of pruning is considered.

For detailed information write *Dean of the University Farm School, Davis, California.*

SCHEDULE OF SHORT COURSE FOR COMMERCIAL HONEY PRODUCERS

Monday. (Registration previous to 1 P.M.)

1:00 P.M. Behavior of Bees in the Fall.

E. F. Phillips

3:00 P.M. Beekeeping Practice in the Fall.

Geo. S. Demuth

7:30 P.M. Beekeeping Problems in California.

J. D. Bixby

* This course will be given at Fresno, November 24 to 29; Riverside, December 1 to 6; San Diego, December 8 to 13.

Tuesday.

9:00 A.M.	Behavior of Bees in Winter.	E. F. Phillips
10:30 A.M.	Beekeeping Practice in Winter.	Geo. S. Demuth
1:00 P.M.	Beekeeping Winter Problems in California.	Mrs. Florence Richardson
2:00 P.M.	Extracting and Care of Honey.	M. H. Mendelson
3:00 P.M.	Migratory Beekeeping Possibilities.	J. D. Bixby
4:00 P.M.	Keeping Records.	Mrs. Richardson
7:30 P.M.	Visiting with Beekeepers (illustrated).	E. F. Phillips

Wednesday.

9:00 A.M.	Behavior of Bees in Spring.	E. F. Phillips
10:30 A.M.	Beekeeping Practice in Spring.	Geo. S. Demuth
1:00 P.M.	Spring Manipulations in California.	J. D. Bixby
2:00 P.M.	Migratory Beekeeping Methods.	W. H. Mendelson
3:00 P.M.	Behavior of Bees in Summer.	E. F. Phillips
4:00 P.M.	Evolution of Beekeeping Practice in the United States.	Geo. S. Demuth
7:30 P.M.	Marketing and Organization.	C. B. Justice

Thursday.

9:00 A.M.	Queen Breeding. General Principles.	Geo. A. Coleman
10:30 A.M.	Beekeeping Practice in Summer.	Geo. S. Demuth
1:00 P.M.	Diagnosis and Treatment of Brood Diseases.	E. F. Phillips
4:00 P.M.	Control of Brood Diseases through State Activities.	Geo. S. Demuth
7:30 P.M.	Undeveloped Territory in California.	Geo. A. Coleman

Friday.

9:00 A.M.	Queen Breeding. Heredity in Disease and Resistant Stock. Pedigreed Queens.	Geo. A. Coleman
10:30 A.M.	Behavior of Bees during Swarming.	E. F. Phillips
1:00 P.M.	Swarm Control.	Geo. S. Demuth
2:00 P.M.	Factors Influencing Nectar Secretion.	E. F. Phillips
3:00 P.M.	The Size of Hives.	E. R. Root
4:00 P.M.	Locality.	Geo. S. Demuth
7:30 P.M.	An Eastern Beekeeper in California.	E. R. Root

Saturday.

9:00 A.M.	Conditions under which European Foul Brood is Epidemic.	E. F. Phillips
10:30-12.	Questions. Adjournment.	Mrs. Richardson

VI. THE SHORT COURSE IN DECIDUOUS FRUITS

DECEMBER 8 TO 20, 1919

The Short Course in Horticulture this year will be limited to a consideration of the principal deciduous fruits, viz., almonds, apples, apricots, cherries, peaches, pears, plums, and prunes. Others, however, may be discussed upon request. The course is designed to meet the needs of the busy man who can leave his work for only a few days at a time. Only the most essential operations

in fruit production will be considered. The feature of the course will be the one whole week devoted to pruning. Demonstrations will be given in several outlying commercial orchards. The latest methods in pruning to secure earlier bearing and for the rejuvenation of old trees will be fully explained and demonstrated.

SCHEDULE OF SHORT COURSES FOR DECIDUOUS FRUITS

STAFF OF INSTRUCTORS

J. C. WHITTEN	E. L. OVERHOLSER
W. L. HOWARD	W. L. SWEET
W. P. TUFTS	G. L. PHILP
A. H. HENDRICKSON	M. N. WOOD

Monday, December 8:

Forenoon Registration.

1-4 Spraying Machinery and Equipment.

A leading feature will be a comparative test of spray guns.

7:30 Informal Smoker and Get-Acquainted Evening for Men and Women.

Tuesday, December 9:

8-12 Spray Materials.

Preparations of lime sulphur, sulphur glue and Bordeaux mixture; discussion and demonstration of poisons; oil sprays and other contact insecticides. Safe and unsafe mixtures of sprays.

1-4 Spraying in the Orchard.

What constitutes a properly sprayed tree.

Wednesday, December 10:

8-12 Insect Control of Deciduous Orchards.

Discussion and demonstration of controlling red spider, codling moth, aphids, peach worm, thrips, borers, and scale insects.

1-4 Disease Control of Deciduous Orchards.

Discussion and demonstration of methods of controlling pear blight, peach blight, walnut blight, peach leaf curl, shot-hole fungus, apple and pear scab, apple mildew, brown rot, oak fungus, crown gall, heart rot, and gummosis of cherry and apricot.

Thursday, December 11:

8-10 Protecting Trees Against Sunburn, Rabbits, Borers and Heart-rot.

Lecture and demonstration on whitewashes, tree protectors, anti-septics and wound paints.

10-12 Grading and Packing of Fresh Fruits.

Discussion and demonstration of grades, packages and packing.

1-4 Drying and Curing of Fruits.

Discussion and demonstration of equipment, processing, storage and costs of drying deciduous fruits.

7:30 Public Lecture. Mr. Geo. H. Hecke.

Work of the California State Commission of Horticulture.

Friday, December 12:

8-10 Laying Out and Planting the Orchard.

Lecture and demonstration of best methods of planting a new orchard and replanting among old trees.

10-12 Irrigation of Deciduous Orchards.

Irrigation appliances. A discussion of the installation of a system for orchard irrigation. The selection of pumping machinery, the installation and use of modern equipment, including concrete pipe, gates, valves, etc.

1-4 Irrigation of Deciduous Orchards.

Lecture and demonstration of methods of irrigation used under varying conditions of soil type, topography and water supply. Duty of water for orchards with special reference to the time of irrigation and proper quantities of water to apply.

Saturday, December 13:

8-10 Pollination of Deciduous Fruits.

Lecture on how fruits are pollinated and the necessity for having a proper mixture of varieties in the orchard.

10-12 Round Table Discussion of the work of the week.

Monday, December 15:

8-12 Pruning Deciduous Fruits.

Lecture and demonstration on how trees grow. How to estimate the next year's crop from the winter buds.

1-4 Pruning Young Trees up to Bearing Age.

Practice period in the experimental pruning blocks of the University Farm Orchard.

Tuesday, December 16:

8-12 Principles Underlying the Pruning of Bearing Trees.

Lecture and practice period in the experimental pruning blocks of the University Farm Orchard.

1-4 Pruning Old Almond Trees.

Practice period in an old almond orchard.

7:30 Public Lecture. Dr. J. C. Whitten.

Work of the Division of Pomology of the University of California.

Wednesday, December 17:

8-12 Pruning Young Bearing Trees.

Lecture and practice period in the University Farm Orchard.

1-4 Pruning Old Prune Trees.

Practice period in an old prune orchard.

Thursday, December 18:

8-12 Pruning Old Apricot Trees.

Demonstration in old apricot orchards near Winters.

1-4 Pruning Old Peach Trees.

Demonstration in old peach orchards near Winters.

Friday, December 19:

8-12 } Pruning Old Cherry, Plum and Other Trees.

1-4 } Demonstrations in old orchards near Vacaville.

7:30 Banquet in Dining Hall at University Farm, Davis.

Saturday, December 20:

8-12 Pruning Pears in Old Sacramento River Orchards.

UNIVERSITY OF CALIFORNIA—COLLEGE OF AGRICULTURE
UNIVERSITY FARM, DAVIS, CALIFORNIA

FARMERS' SHORT COURSES, 1919

APPLICATION FORM

I expect to attend the Short Course in.....

.....

My occupation is

.....

My experience in farming, dairy, creamery, stock raising, fruit growing,
grape growing, or poultry has been

.....

.....

.....

(Signed)

Home Address

.....

Age

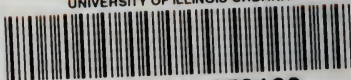
Date of Application

It will be helpful to us to know approximately the expected attendance upon the courses before their time of beginning, and applicants are therefore requested to fill out and mail this blank as soon as they have decided to attend the Short Course. Address:

Dean, University Farm School,
Davis, California.

SCHEDULE OF COURSES

1919	PAGE
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Sept. 29-Nov. 7	General Agriculture (including Animal Husbandry).... 11
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	Dairy Manufactures 26
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Nov. 10-22	Beekeeping 43
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Dec. 8-20	Deciduous Fruits 45



UNIVERSITY OF CALIFORNIA BULLETIN

A SERIES IN THE ADMINISTRATIVE BULLETINS
OF THE UNIVERSITY OF CALIFORNIA

- Entered July 1, 1911, at the Post Office at Berkeley, California,
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of July 16, 1894

Issued monthly from July to March, and twice a month from
April to June

These Bulletins include:

The Circular of Information, Academic Departments.

The Annual Announcement of the Summer Session.

The Annual Announcements of the Medical School, the Colleges of
Dentistry, Law, and Pharmacy.

The President's Annual Report.

The Prospectus of the College of Agriculture.